REVISIONS

Changes and/or additions in this checklist will be covered by Owner Advisories published by the Piper Aircraft Corporation. It is the responsibility of DSU to maintain this checklist in a current status when it is used for operational purposes. Additional checklist procedures may be inserted within the manufacture’s procedures by DSU Flight Operations.

A revision bar will extend the full length of new or revised text and/or illustrations added on new or existing pages. This Bar will be located adjacent to the applicable revised area on the outer margin of the page. All revised pages will carry the date of the revision on the applicable page.

LOG OF REVISIONS

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ALL REFERENCES TO SECTIONS THROUGHOUT THIS CHECKLIST PERTAIN TO THE APPROPRIATE SECTION OF THE PILOT’S OPERATING MANUAL, OPERATING INSTRUCTIONS SECTION.
NORMAL PROCEDURES

Visually check airplane for general condition during walk-around inspection. In cold weather, remove even the smallest of accumulations of frost, ice or snow from wing, tail and control surfaces. If a night flight is planned, check operation of all lights and ensure a flashlight is available. For detailed information and explanation of these procedures, refer to the Airplane Flight Manual, Operating Instructions.

Procedures in the following Normal checklist shown in **bold-faced** should be committed to memory.
**PREPARATION**

Flight Log..........................CHECK FOR OPEN SQUAWKS
Hobbs/Tach Meters.......................... RECORD
100 Hour/Annual Insp/VOR.................. CHECK
Required Papers.......................... ON BOARD
Weather.................................. SUITABLE
Baggage.......................... WEIGHED, STOWED, TIED
Weight and C.G.......................... WITHIN LIMITS
Navigation.......................... PLANNED
Charts and navigation equipment........... ON BOARD
Performance and range................. COMPUTED AND SAFE

**PREFLIGHT CHECK**

**COCKPIT**

Control Wheel.......................... RELEASE BELT
Landing Gear Handle....................... DOWN
Parking Brake.......................... SET
Avionics.......................... OFF
All Switches.......................... OFF
Magneto Switches.......................... OFF
Master Switch.......................... ON
Landing Gear Lights..................... 3 GREEN NO RED
Fuel Quantity Gauges.................. CHECK
Cowl Flaps.......................... OPEN
Internal Lights.......................... CHECK
External Lights.......................... CHECK
Stall Warning Horns..................... TEST
Pitot Heat.......................... CHECK
Master Switch.......................... OFF
Mixture.......................... IDLE CUT-OFF
Trim.......................... SET TO NEUTRAL
Flaps.......................... EXTEND FULL DOWN
Flight Controls .................................................. CHECK
Empty Seats ........................................... SEAT BELTS SNUGLY FASTENED
Windshield ........................................................... CLEAN
Baggage .............................................................. SECURED

**Right Wing**

Surface Condition ............ FREE OF ICE, SNOW, FROST
Flap, Hinges, and Actuator ......................................... CHECK
Aileron, Hinges and Actuator .................................. CHECK
Static Wicks ................................................................ CHECK
Wing Tip and Lights ................................................... CHECK
Fuel Tank ................................ VISUALLY CHECK SUPPLY
Fuel Vents .......................................................... CHECK OPEN
Tank Sumps .................. DRAIN CHECK FOR WATER SEDIMENT AND PROPER FUEL
Gascolator .......................... DRAIN AND CHECK
Wing Tie-Down .................................................. REMOVE
Engine Compartment ....................... OPEN AND INSPECT
Engine Oil ..................................................... CHECK 6-8 QUARTS
Engine Nacelle .................................................. SECURE
Propeller and Spinner ............................................... CHECK
Cowl Flaps .......................... OPEN AND SECURE
Air Intakes .................................................. UNOBBSTRUCTED
Chock .......................................................... REMOVE
Tire Condition .......................... CHECK
Shock Strut .......................... EXTENDED 3 ½ INCHES
Brake Block/Disc/Pad .................................. CHECK
Hydraulic Lines .................................................. CHECK
Main Gear Components .................................. CHECK
Main Gear Doors .................................................. SECURE
Nose Section

General Condition.................................................. CHECK
Windshield.............................................................. CLEAN
Nose Gear Components............................................. CHECK
Landing/Taxi Lights .................................................. CHECK
Nose Gear Doors..................................................... SECURE
Nose Gear Strut.......................... EXTENDED 2 ½ INCHES
Chock ................................................................. REMOVE
Tire ................................................................. CHECK
Forward Baggage Door ................. CHECK/SECURE/LOCK
External Receptacle ........................... CLOSED

Left Wing

Chock ................................................................. REMOVE
Tire Condition ............................................................ CHECK
Shock Strut ............................................................. EXTENDED 3 ½ INCHES
Brake Block/Disc/Pad ............................................. CHECK
Hydraulic Lines ................................................... CHECK
Main Gear Components .................. CHECK
Main Gear Doors ................................ SECURE
Engine Compartment ............. OPEN AND INSPECT
Engine Oil ......................................................... CHECK 6-8 QUARTS
Engine Nacelle ................................................ CHECK
Propeller and Spinner ......................... CHECK
Wing Tie-Down .................................................... REMOVE
Air Intakes ............................................................ UNOBSTRUCTED
Cowl Flaps ........................................................... OPEN AND SECURE
Gascolator ........................................................... DRAIN AND CHECK
Fuel Tank ......................................................... VISUALLY CHECK SUPPLY
Fuel Vents ............................................................... CHECK OPEN
Tank Sumps .................................................. DRAIN CHECK FOR WATER SEDIMENT AND PROPER FUEL
Pitot Mast .............................................................. CHECK OPEN
Stall Warning Vanes .............................................. CHECK
Wing Tip and Lights ................................................. CHECK
Aileron, Hinges and Actuator ................................. CHECK
Flap, Hinges and Actuator .................................. CHECK
Static Wicks ...................................................... CHECK
Surface Condition .............. FREE OF ICE, SNOW, FROST

**Fuselage, Left Side**

Condition ............................... FREE OF ICE, SNOW, FROST
Antennas .......................................................... SECURE
Side Windows .................................................. CLEAN
Left Static Vent ................................................. CLEAR
Side Door ......................................................... SECURE

**Empennage**

Condition ............................... FREE OF ICE, SNOW, FROST
Fresh Air Inlet .................................................. UNOBSTRUCTED
Stabilator Trim and Push Rod .......................... CHECK
Rudder and Stabilator Hinges ......................... CHECK
Tie Down ......................................................... REMOVE

**Fuselage, Right Side**

Condition ............................... FREE OF ICE, SNOW, FROST
Antennas .......................................................... SECURE
Right Static Vent ............................................ CLEAR
Side Windows .................................................. CLEAN
Before Starting Engines

Passengers .......................................................... BRIEFED
Seats .......................................................... ADJUSTED
Cabin Door ..............CLOSE and SECURE AS REQUIRED
Belts and Harnesses ................. FASTENED - CHECK INERTIA REEL
Parking Brake .................................................. SET
Cabin Fan .......................................................... OFF
Fuel Selectors .................................................. BOTH ON
Circuit Breakers .................................................. IN
Avionics Switch .................................................. OFF
Cowl Flaps .................................................. OPEN
Alternate Air .................................................. OFF
Anti-Collision Light .................................................. ON
Alternators .................................................. ON

Starting Engines when COLD

NOTE
To prevent starter damage, limit starter cranking to 30-second periods. If the engine does not start within that time, allow a cooling period of several minutes before engaging starter again. Do not engage the starter immediately after releasing it.

Mixture Controls .................................................. IDLE CUT-OFF
Throttle Controls .................................................. OPEN ½ INCH
Propeller Controls .................................................. FULL FORWARD
Master/Battery Switch .................................................. ON
Magneto Switches .................................................. ON
Electric Fuel Pumps .................................................. ON
Mixture Controls .................................................. RICH POSITION UNTIL FUEL FLOW then IDLE CUT-OFF
Electric Fuel Pump .................................................. OFF
Propeller Area .................................................. CLEAR
Starter ................................................................. ENGAGE
Mixture ............................................... ADVANCE AS ENGINE STARTS
Throttle ........................................................... SET TO 1,000 RPM
Oil Pressure............................................................. CHECK

REPEAT SEQUENCE FOR #2 ENGINE

Electric Fuel Pumps......................... OFF, CHECK PRESSURE

Starting Engine when HOT

Mixture Controls ............................................ IDLE CUT-OFF
Throttle Controls ........................................... OPEN ½ INCH
Propeller Controls ........................................ FULL FORWARD
Master/Battery Switch ...................................... ON
Magneto Switches ........................................ ON
Electric Fuel Pumps ........................................ OFF
Propeller Area ............................................... CLEAR
Starter ........................................................... ENGAGE
Mixture ............................................... ADVANCE AS ENGINE STARTS
Throttle ........................................................... SET TO 1,000 RPM
Oil Pressure............................................................. CHECKED

REPEAT SEQUENCE FOR #2 ENGINE

NOTE
If an engine does not start with the above method, which omits the priming, use the normal Starting Engine when COLD procedure, which includes priming

Starting Engine when FLOODED

Mixture Control ............................................ IDLE CUT-OFF
Throttle .................................................. FULL FORWARD
Propeller Control ........................................ FULL FORWARD
Master/Battery Switch ...................................... ON
Magneto Switches ........................................ ON
Electric Fuel Pump ........................................ OFF
Propeller Area .......................................................... CLEAR
Starter ................................................................. ENGAGE
Throttle ...................................................... RETARD WHEN ENGINE STARTS
Mixture ......................................................... ADVANCE SLOWLY
Throttle ........................................................ SET TO 1,000 RPM
Oil Pressure .......................................................... CHECKED

Starting Engine with EXTERNAL POWER

Master/Battery Switch ............................................. OFF
Terminals ............................................................. CONNECT
RED LEAD to POS (+)
BLACK LEAD to NEG (-)
Master/Battery Switch ............................................. ON
Magneto Switches .................................................. ON
Engine ................................................................. START
Master/Battery Switch ............................................. OFF
External Power ....................................................... DISCONNECT
Master/Battery Switch ............................................. ON

NOTE
Do not attempt flight if there is no indication of alternator output

Warm-UP Checklist

Throttle .............................................................. 1000 RPM
Oil Pressure ............................................................ CHECK
**Pre-Taxi Checklist**

Fuel Pump ............................................OFF, CHECK PRESSURE
Avionics Switch ..................................................ON
Mixture ..........................................................LEAN FOR TAXI
Transponder ..................................................ALT
ATIS/Airport Info ......................................RECEIVED
Altimeter ..................................................SET
Heading Indicator .................................CHECK TO COMPASS
Departure Clearance ...............................RECEIVED
Transponder ..................................................SET
Nav Radios ..................................................SET
Comm Radios ..................................................SET
Taxi Light ..................................................AS REQUIRED

**Taxi Checklist**

Taxi Area ..........................................................CLEAR
Parking Brake ..................................................RELEASE
Throttle ..................................................APPLY SLOWLY
Brakes ..................................................CHECK
Steering ..................................................CHECK
Mag Compass ..................................SWINGS FREELY
Attitude Indicator .................................................ERECT
Turn Coordinator .............SHOWS TURN DIRECTION
Ball & Inclinometer ...............MOVES TO OUTSIDE OF TURN
Left Fuel Selector .............CROSSFEED (1 min) then ON
Right Fuel Selector ..........CROSSFEED (1 min) then ON

**NOTE**

Do not attempt takeoff with fuel selectors on crossfeed
**Ground Runup Checklist**

Parking Brake .......................................................... SET
Fuel Selectors ............................................................ ON
Mixture ................................................................. FORWARD
Propeller ............................................................... FULL FORWARD
Throttle ................................................................. 1500 RPM
Propellers ......................... FEATHER then FULL FORWARD
Throttle ................................................................. 2000 RPM
Propellers ............................................. RETARD 200-300 RPM
Throttle .......... INCREASE SLIGHTLY
Propellers ........................................... FULL FORWARD
Alternate Air .......................................................... CHECK
Magnetos ................. MAX DROP 175; MAX DIFF. 50 RPM
Alternator .......................................................... CHECK
Vacuum .......................... NO LIGHTS, 4.5 to 5.2 in HG
Throttle ........................................... 800 to 1000 RPM
Parking Brake .................................................. RELEASE

**Pre-Takeoff Checklist**

Fuel Selectors .......................................................... ON
Alternator Switches .................................................. ON
Engine Gauges ......................................................... CHECK
Flight Instruments ..................................................... SET
Mixture ................................................................. SET
Propeller ............................................................... FULL FORWARD
Quadrant Friction .................................................. ADJUST
Alternate Air .......................................................... OFF
Cowl Flaps ............................................................. SET
Seat Backs ............................................................. ERECT
Belts/Harness ......................................................... FASTENED/CHECK
Flaps ................................................................. SET
Trim ................................................................. SET
Controls ............................................................. FREE
Electric Fuel Pumps .................................................. ON
Pitot Heat ............................................................ AS REQUIRED
**Takeoff Briefing**

Takeoff Procedure ...................................................... BRIEF
Takeoff Emergencies .................................................. BRIEF
Eng Failure Considerations ........................................ BRIEF

*When Cleared for Takeoff*

Strobe .............................................................................. ON
Landing/Taxi ..................................................................... ON
Door and Window ........................................................... LATCHED

**Takeoff**

**NORMAL TAKEOFF**

Nose Wheel ................................................................. STRAIGHT
Directional Gyro ......................................................... CHECKED TO RWY HDG
Brakes ........................................................................... APPLY AND HOLD
Throttle ........................................................................... 2,000 RPM
Engine Gauges .............. CHECKED AND SYMMETRICAL
Power ................................................................. FULL ADVANCE
Brakes ................................................................. RELEASED
Airspeed ............................................................... ALIVE
Rotate ................................................................. .85 MPH
Gear ............................................................... POSITIVE RATE – GEAR UP
Climb ........................................................................... 105 MPH

**SHORT FIELD TAKEOFF (FLAPS UP)**

Flaps ................................................................. UP
Trim .......................................................................... SET
Nose Wheel ................................................................. STRAIGHT
Directional Gyro ....................................................... CHECKED TO RWY HDG
Brakes ................................................................. APPLY AND HOLD
Throttle .................................................. 2,000 RPM
Engine Gauges ............................... CHECKED ALL GREEN
Power ........................................ FULL ADVANCE
Brakes ................................................... RELEASED
Airspeed ................................................. ALIVE
Rotate .................................................. 80 MPH
Initial Climb ........................................ 85 MPH
Gear ...................................................... POSITIVE RATE – GEAR UP
Climb ...................................................... 90 MPH

SHORT FIELD TAKEOFF (25° FLAPS)

Flaps ................................................................ 25°
Trim .......................................................... SLIGHTLY NOSE UP
Nose Wheel .................................................. STRAIGHT
Directional Gyro ................................. CHECKED TO RWY HDG
Brakes ...................................................... APPLY AND HOLD
Throttle ...................................................... 2,000 RPM
Engine Gauges ............................... CHECKED ALL GREEN
Power ...................................................... FULL ADVANCE
Brakes ...................................................... RELEASED
Airspeed .................................................. ALIVE
Rotate ..................................................... 70 MPH
Initial Climb ............................................. 80 MPH
Gear ...................................................... POSITIVE RATE – GEAR UP
Flaps ....................................................... RETRACT SLOWLY
Climb ...................................................... 90 MPH
Climb

Throttles .............................................................. 25 INCH
Propellers .................................................. SYNC @ 2,500 RPM
Mixture .............................................................. 10 GPH
Flaps .......................................................... UP
Electric Fuel Pumps................................. OFF @ 1,000 AGL
Lights .............................................................. OFF
Cruise Climb ...................................................... 120 MPH

Cruise Checklist

Throttles ........................................................... ADJUST
Propeller .................................................. SYNC @ 2,400 RPM
Mixture ........................................................... ADJUST
Cross feed ..................................................... AS REQUIRED
Cowl Flaps ..................................................... AS REQUIRED

Maneuvers Checklist

Practice Area .................................................. CLEAR OF TRAFFIC
Airspeed .................................................. AT OR BELOW $V_A$
Mixture .......................................................... FORWARD
Propellers .................................................. FULL FORWARD
Electric Fuel Pumps ............................................. ON
Landing Light .................................................. ON
Cowl Flaps ..................................................... AS REQUIRED
**Descent Checklist**

ATIS/Airport Info ........................................... RECEIVED
Approach/Landing Brief ................................. COMPLETED
Seat Backs ..................................................... ERECT
Belts/Harnesses ............................................. FASTENED
Mixture ......................................................... AS REQUIRED
Power ............................................................ AS REQUIRED
Landing Light ............................................... ON

**Approach and Landing Checklist**

TO BE COMPLETED BY FAF OR 1,000 FT AGL

Fuel Selectors ............................................... ON
Electric Fuel Pumps ......................................... ON
Mixture ......................................................... RICH
Propeller ....................................................... FULL INCREASE
Landing Gear ............................................... DOWN –THREE GREEN
Flaps ......................................................... SET – 160 MPH MAX
Flaps ............................................................ AS REQUIRED
Final Approach Speed ...................... 105 MPH (FULL FLAPS)

**Go Around Checklist**

Power ......................................................... FULL FORWARD
Pitch .......................................................... UP TO 10°
Flaps ......................................................... RETRACT INCREMENTALLY
Landing Gear .................................. POSITIVE RATE – GEAR UP
Climb .......................................................... 105 MPH
Cowl Flaps ................................................. AS REQUIRED
After Landing Checklist

When Off Runway ........................................ STOP AIRCRAFT
Flaps ........................................................................ UP
Cowl Flaps................................................................. Open
Electric Fuel Pumps.................................................... OFF
Exterior Lights ......................................................... AS REQUIRED
Strobe Light .................................................................... OFF
Mixture ........................................................................ LEANED FOR TAXI

Parking Checklist

STOPPING ENGINES

Parking Brake ............................................................... SET
Propeller ................................................................. FULL FORWARD
Avionics Switch ............................................................... OFF
Throttles ........................................................................ 1000 RPM
Mixtures ........................................................................ IDLE CUT-OFF
Nav and Cockpit Lights .................................................... OFF
Anti-Collision Light ........................................................ ON
Magneto Switches ............................................................. OFF
Master Switches .............................................................. OFF
Alternator Switches ........................................................ OFF
Parking Brake ................................................................. RELEASE
Hobbs and Tach Meters .................................................. RECORD
Squawk Sheet .............................................................. RECORD AND REPORT
Controls .................................................................... RESTRAIN
Aircraft ...................................................................... TIED DOWN AND SECURE
EMERGENCY PROCEDURES

ENGINE FAILURES
- ENGINE FAILURE DURING TAKEOFF
- ENGINE FAILURE DURING CLimb
- ENGINE FAILURE DURING FLIGHT
- SINGLE ENGINE LANDING
- SINGLE ENGINE GO AROUND

PROPELLER
- PROPELLER FEATHERING
- PROPELLER UNFEATHERING
- PROPELLER OVERSPEED

FIRES
- ENGINE FIRE DURING START
- ENGINE FIRE IN FLIGHT

ELECTRICAL
- ELECTRICAL FAILURES
- ELECTRICAL OVERLOAD

ENGINE
- ENGINE RESTART DURING FLIGHT
- ENGINE SHUT-DOWN DURING FLIGHT
- VACUUM SYSTEM FAILURE

LANDING GEAR
- UNSAFE GEAR WARNING
- MANUAL LANDING GEAR EXTENSION
- GEAR-UP LANDING

ICING CONDITIONS
- ENGINE FAILURE IN ICING
- ALTERNATOR FAILURE IN ICING

Procedures in the following Emergency checklists shown in bold-faced type are immediate-action items which should be committed to memory.
ENGINE FAILURES

**ENGINE FAILURE DURING TAKEOFF**

If During Takeoff Roll and <100 MPH

Throttles.......................................................... CLOSE BOTH THROTTLES IMMEDIATELY
Stop ................................................................. STRAIGHT AHEAD

If Inadequate Runway Remains to Stop

Throttles.......................................................... CLOSED
Brakes ......................................................... APPLY MAX BRAKING
Master Switch .......................................................... OFF
Fuel Selectors .......................................................... OFF
Stop .................................................. STRAIGHT AHEAD AVOID OBSTACLES

If Adequate Runway Remains and >100 MPH

Throttles.......................................................... CLOSE BOTH THROTTLES IMMEDIATELY
Land (If Airborne) .............................. STOP STRAIGHT AHEAD

If Inadequate Runway Remains and >100 MPH (Takeoff Continued)

Maintain.................................................. HEADING AND AIRSPEED
Gear .......................................................... RETRACT WHEN CLIMB ESTABLISHED
Inoperative Engine (Confirm) ......................... FEATHER

Go To PROPELLER FEATHERING
ENGINE FAILURES (Continued)

ENGINE FAILURE DURING CLIMB

IF < 80 MPH
Power .............................................................. REDUCE
Accelerate ....................................................... 105 MPH
Mixtures.................................................. FULL FORWARD
Propellers........................................ FULL FORWARD
Throttles........................................... FULL FORWARD
Bank ....................................................5° INTO OPERATING ENGINE
Flaps............................................................. UP
Inoperative Engine (Confirm)............................... FEATHER

Go to PROPELLER FEATHERING

IF > 80 MPH
Maintain............................................. DIRECTIONAL CONTROL
Airspeed................................................... 105 MPH
Mixtures.................................................. FULL FORWARD
Propellers........................................ FULL FORWARD
Throttles........................................... FULL FORWARD
Bank ....................................................5° INTO OPERATING ENGINE
Flaps............................................................. UP
Inoperative Engine (Confirm)............................... FEATHER

Go to PROPELLER FEATHERING

ENGINE FAILURE DURING FLIGHT

Airspeed .............................................................. 105 MPH
Mixtures.................................................. FULL FORWARD
Propellers........................................ FULL FORWARD
Throttles........................................... FULL FORWARD
Bank ....................................................5° INTO OPERATING ENGINE

Go to PROPELLER FEATHERING
ENGINE FAILURES (Continued)

NOTE
The single engine minimum control speed with Rear Cabin and Cargo Doors removed is 81 MPH. If engine failure occurs in this configuration and below 81 MPH, reduce power as necessary on the operating engine to maintain directional control.

SINGLE ENGINE LANDING

Inoperative Engine........................................ FEATHERED
Landing Gear........... DOWN (when LANDING ASSURED
Flaps ......................... 25° (when LANDING ASSURED)
Final Approach Speed................................. 105 MPH

SINGLE ENGINE GO-AROUND

Throttle.................................................. FULL FORWARD
Flaps...................................................... RETRACT
Landing Gear .......................................... RETRACT
Airspeed...................................................... 105 MPH
Trim ............................................................... SET
Cowl Flap .................................................. AS REQUIRED

CAUTION
This procedure must be initiated at or above 400 feet AGL or it may not be successfully completed.
PROPELLER

PROPELLER FEATHERING

Minimum Control Speed ........................................ 80 MPH
Airspeed (VYSE) .................................................. 105 MPH
Maintain ........ DIRECTIONAL CONTROL (90 MPH MIN)
Flaps ................................................................. RETRACT
Gear ................................................................. RETRACT
Electric Fuel Pump ................ OPERATING ENGINE – ON
Inoperative Engine ........................................... IDENTIFY
Throttle Inoperative Engine .......... RETARD TO VERIFY
Propeller Inoperative Engine ........ FEATHER
Mixture Inoperative Engine ........... IDLE CUT-OFF
Trim ................................................................. AS REQUIRED
Bank .............................................................. 5° TOWARD OPERATING ENGINE
Electric Fuel Pump Inoperative Engine .................. OFF
Magnetos Inoperative Engine ......................... OFF
Cowl Flaps Inoperative Engine ................. CLOSE
Cowl Flaps Operative Engine ......................... OPEN
Alternator Inoperative Engine ............... OFF
Fuel Selector Inoperative Engine ............ OFF
Crossfeed .................................................... AS REQUIRED
Electric Fuel Pump Operative Engine ......... OFF
Electrical Load ...................... REDUCE < 50 AMPERES

Go To SINGLE ENGINE LANDING

PROPELLER UNFEATHERING

Fuel Selector ...................... INOPERATIVE ENGINE – ON
Electric Fuel Pump ............. INOPERATIVE ENGINE – OFF
Throttle ....................................................... OPEN ¼ INCH
Propeller ......................... FORWARD, CRUISE RPM

(Continued on next page)
PROPELLER (Continued)

Mixture .......................................................... RICH
Magneto Switch .................................................. ON
Starter .................. ENGAGE UNTIL PROP WINDMILLS
Throttle .................. REDUCE UNTIL ENG WARMs

If Engine Starts
Alternator .......................................................... ON

If Engine Does Not Start
Electric Fuel Pump .................. INOPERATIVE ENGINE – ON
  3 SECONDS then OFF
Starter .................. ENGAGE UNTIL PROP WINDMILLS
Throttle .................. REDUCE UNTIL ENG WARMs
Alternator .......................................................... ON

If Unable To Start Engine

  Go To PROPELLER FEATHERING

(Continued on next page)
PROPELLER (Continued)

PROPELLER OVERSPEED

Throttle ................................................................. CLOSE
Airspeed ................................................................. 105 MPH
Propeller ................................................................. LOW RPM
Throttle ......................................................... SLOWLY INCREASE
Propeller ......................................................... SLOWLY INCREASE

CONTINUE FLIGHT AT REDUCED SPEED AND POWER.
LAND AS SOON AS PRACTICAL

NOTE
Loss of air charge in the propeller dome may result in overspeed if throttle is advanced rapidly or airspeed is abruptly increased. If this happens, the propeller will not feather.

If the throttle is retarded below 15-20 inch manifold pressure at speeds above 105 MPH, the propeller may overspeed again upon reapplying power.

FIRES

ENGINE FIRE DURING START

Starter ................................................................. CRANK ENGINE
Mixture .............................................................. IDLE CUT-OFF
Throttle ................................................................. OPEN
Electric Fuel Pump ............................................. OFF
Fuel Selector ...................................................... OFF

ABANDON IF FIRE CONTINUES
ENGINE FIRE ON THE GROUND

If Engine has not Started
Mixture .......................................................... IDLE CUT OFF
Throttle ................................................................................. OPEN
Engine Starter ................................................................. ENGAGE

If engine has started and is running, continue operating. If fire continues longer than a few seconds, the fire should be extinguished by the best available external means.

If External Fire Extinguishing is to be Applied

Fuel Selector Valves............................................................. OFF
Mixture ......................................................................... IDLE CUT OFF

ENGINE FIRE IN FLIGHT

AFFECTED ENGINE
Fuel Selector ................................................................. OFF
Throttle ........................................................................ CLOSE
Propeller ................................................................. FEATHER
Mixture ..................................................................... IDLE CUT OFF
Heater ........................................................................ OFF
Defroster ................................................................. OFF

LAND IMMEDIATELY AS TERRAIN PERMITS

Go To PROPELLER FEATHERING
ELECTRICAL

ELECTRICAL FAILURE
(If in Icing Conditions, Go To Alternator Failure in Icing)

LOSS OF OUTPUT FROM ONE ALTERNATOR

Electrical Load.............................. REDUCE < 50 AMPERES
Circuit Breakers................................................. CHECK
Alternator Switch .......................................... CYCLE
OFF then ON

If power not restored
Alternator Switch ................................................. OFF
Electrical Load.............................. REDUCE < 50 AMPERES

LAND AS SOON AS PRACTICAL

LOSS OF OUTPUT FROM BOTH ALTERNATORS

Electrical Load.............................. REDUCE < 50 AMPERES
Circuit Breakers................................................. CHECK
Alternator Switches........................................... CYCLE

If power not restored
Alternator Switches.............................................. OFF
Electrical Load.............................. REDUCE TO MINIMUM

WARNING
Compass error may exceed 10° with both alternators inoperative

CAUTION
If the battery is depleted, the landing gear must be lowered using the emergency extension procedure. The gear position lights will be inoperative

LAND AS SOON AS POSSIBLE
ELECTRICAL (Continued)

**ELECTRICAL OVERLOAD**

**ONE OVERVOLTAGE LIGHT ILLUMINATED**

Electrical Loads ......................................................... OFF
EXCEPT MASTER SWITCH
Alternator Switch .......................................................... OFF
Overvoltage ................................................................. VERIFY
AFFECTED ALTERNATOR ON then OFF
Electrical Load................................. REDUCE < 50 AMPERES

**BOTH OVERVOLTAGE LIGHT ILLUMINATED**

Electrical Loads ............................................................ OFF
EXCEPT MASTER SWITCH
Alternator Switches ......................................................... OFF
Overvoltage ................................................................. CHECK
EACH ALTERNATOR ON then OFF
Least Overvoltage Alternator ........................................... ON
Electrical Load................................. REDUCE < 50 AMPERES

**If Both Alternators Indicate < 50 Amperes Each**

Alternator Switches ......................................................... ON
Electrical Load....................................................... AS REQUIRED
ENGINE

ENGINE RESTART DURING FLIGHT

Go to PROPELLER UNFEATHERING

ENGINE SHUT-DOWN DURING FLIGHT

Throttle................................................................. CLOSE
Propeller ......................................................... FEATHER
Mixture ................................................... VERIFY DESIRED ENGINE
                                           IDLE CUT-OFF
Magneto............................................. VERIFY DESIRED ENGINE
                                           OFF
Electric Fuel Pump.............................. OFF
Alternator ......................................................... OFF
Cowl Flaps ......................................................... CLOSE
Fuel Selector............ VERIFY DESIRED ENGINE - OFF
CROSSFEED ................................................. AS REQUIRED

VACUUM SYSTEM FAILURE

Engine RPM ............................................................. 2700
Altitude ............................................................. DECREASE

NOTE
Use the Turn Indicator to monitor the Directional Gyro and Attitude Indicator performance
LANDING GEAR

UNSAFE GEAR WARNING

Landing Gear .................................. RECYLE
Landing .................................. PLAN FOR NORMAL LANDING

NOTE
The landing gear lights will illuminate when the gear warning horn sounds and the gear warning horn will sound at low throttle settings with the gear in the up and locked position

MANUAL LANDING GEAR EXTENSION

Circuit Breakers .................................. CHECK
Master Switch .................................. ON
Alternators .................................. CHECK
Navigation Lights .................................. OFF
Airspeed .................................. 100 MPH
Landing Gear Handle ............... GEAR DOWN LOCKED
Emergency Extension Knob ....................... PULL
Landing Gear ............... CHECK – THREE GREEN LIGHTS

WARNING
If the emergency gear extension knob has been pulled out to lower the gear due to a gear system malfunction, leave the control in its extended position until the airplane has been put on jacks to check the proper function of the landing gears hydraulic and electrical systems.
LANDING GEAR (Continued)

GEAR-UP LANDING

Approach Speed .................................................. NORMAL
Flaps ........................................................................ UP

When Landing Assured

Throttles ................................................................. CLOSE
Master Switch ......................................................... OFF
Ignition Switch ......................................................... OFF
Fuel Selector .......................................................... OFF
Airspeed ............................................................... MINIMUM
ICING CONDITIONS

ENGINE FAILURE IN ICING

Alternate Air................................................................. ON

ATTEMPT ENGINE RESTART

Go to PROPELLER UNFEATHERING

If Unable to Restart Engine
Propeller ................................................................. FEATHER
Airspeed ................................................................. 105 MPH
Electrical Load................................. REDUCE < 50 AMPERES

AVOID ICING CONDITIONS, LAND AS SOON AS PRACTICAL

Go to PROPELLER FEATHERING

ALTERNATOR FAILURE IN ICING

Alternator Overvoltage Relay................................. RESET
Circuit Breakers................................................................. CHECK

If Unable to Restore Alternator
Avionics................................................................. OFF
EXCEPT ONE NAVCOM AND XPONDER

AVOID ICING CONDITIONS, LAND AS SOON AS PRACTICAL
PERFORMANCE

Speeds are for Aircraft at Max Gross Weight

Takeoff
Rotation Speed ($V_R$) 85 MPH
Lift-Off ($V_{LOF}$) 90 MPH
Minimum Controllable ($V_{MC}$) 80 MPH

Climb
Best Angle ($V_X$) 90 MPH
Best Rate ($V_Y$) 105 MPH
Cruise Climb 120 MPH
Best Rate Single Engine ($V_{YSE}$) 105 MPH
Best Glide Speed ($V_G$) 105 MPH

Landing Approach
Flaps 10 ($V_{FE10}$) 160 MPH
Flaps 25 ($V_{FE25}$) 140 MPH
Flaps 40 ($V_{FE40}$) 125 MPH

Maneuvering Speed ($V_A$) Turbulent Air Penetration Speed
4200 Lbs 146 MPH
2743 Lbs 133 MPH

Stall Speeds
Stall Speed Flaps ($V_{SO}$) 69 MPH
Stall Speed Clean ($V_{S1}$) 76 MPH

Maximum Speed
Normal Operation ($V_{NO}$) 190 MPH
Landing Gear Extended ($V_{LE}$) 150 MPH
Landing Gear Retraction Speed 125 MPH
Never Exceed Speed ($V_{NE}$) 217 MPH
Max Demonstrated X-Wind Component 15 Kts
NORMAL TAKEOFF, 0° FLAPS

TAKE-OFF GROUND RUN DISTANCE
AT VARIOUS ALTITUDES,
TEMPERATURES, WEIGHTS, AND WINDS

FULL POWER BEFORE BRAKE RELEASE
FLAP SETTING - 0°
LIFT-OFF SPEED - 80 MPH
SHORT FIELD EFFORT
PAVED LEVEL DRY RUNWAY

PRESURE ALTITUDE - FT

GROUND RUN DISTANCE - FT

TEMPERATURE - °F

WEIGHT - LBS.

HEADWIND - MPH
SHORT FIELD TAKEOFF 25° FLAPS

TAKE-OFF GROUND RUN DISTANCE
AT VARIOUS ALTITUDES,
TEMPERATURES, WEIGHTS, AND WINDS

FULL POWER BEFORE BRAKE RELEASE
FLAP SETTING - 25°
LIFT-OFF SPEED - 70 MPH
SHORT FIELD EFFORT
PAVED LEVEL DRY RUNWAY

PRESURE ALTITUDE - FT

TEMPERATURE - °F

WEIGHT - LBS.

HEADWIND - MPH

GROUND RUN DISTANCE - FT

DELWART STATE UNIVERSITY
ACCELERATE-STOP DISTANCE
CRUISE PERFORMANCE

CRUISE PERFORMANCE - RANGE
4200 LBS GROSS WEIGHT
98 GAL. TOTAL FUEL (93 GAL. USABLE)
2400 RPM
BEST ECONOMY
GEAR UP
MIXTURE - LEAN PER LYCOMING INSTRUCTIONS

NO RESERVE
--- 45 MIN. RESERVE AT 55% POWER

DENSITY ALTITUDE - FEET

PERCENT RATED POWER

75 65 45

PERCENT
5

RATED
POWER

APPROX.
GPH
TOTAL

75 65 55 45
20.6 18.3 16.0 14.0

RANGE - STATUTE MILES
LANDING PERFORMANCE

LANDING GROUND RUN DISTANCE AT VARIOUS ALTITUDES, TEMPERATURES, WEIGHTS, AND WINDS

PAVED LEVEL DRY RUNWAY TOUCHDOWN SPEED - 67 MPH
FLAP SETTING - 40° RETRACT FLAPS ON ROLLOUT - FULL BRAKING

PRESSURE ALTITUDE - FT

8000
8000
4000
2000
SL

GROUND RUN DISTANCE - FT

1100
1000
900
800
700
600
500
400
300
200

TEMPERATURE - °F
WEIGHT - LBS.
HEADWIND - MPH