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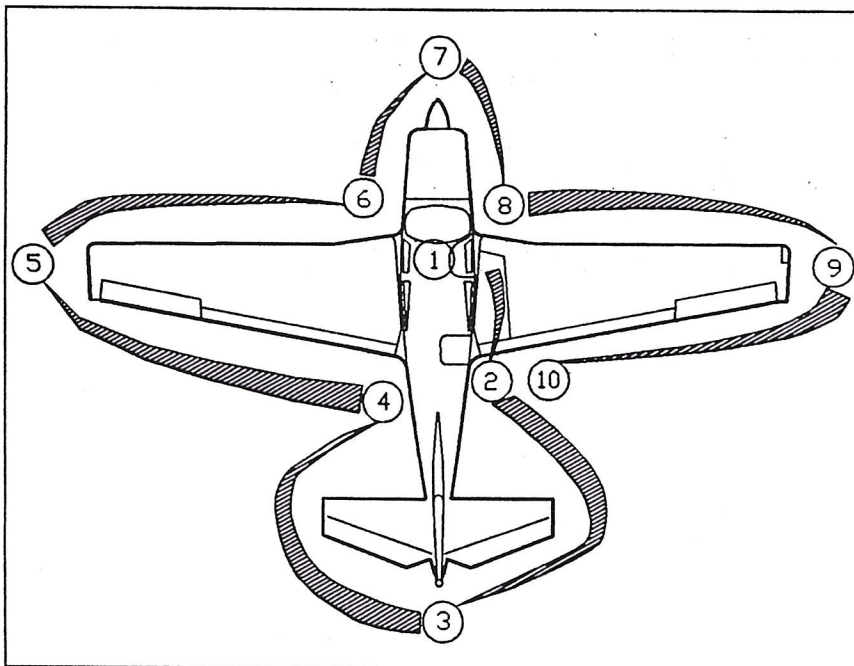
INTRODUCTION

This section describes the recommended procedures for the conduct of normal operations for the airplane. All of the required (FAA regulations) procedures and those necessary for operation of the airplane as determined by the operating and design features of the airplane are presented.

These procedures are provided to present a source of reference and review and to supply information on procedures which are the same for all aircraft. Pilots should familiarize themselves with the procedures given in this section in order to become proficient in the normal operations of the airplane.

Normal procedures associated with those optional systems and equipment which require handbook supplements are provided by SECTION IX (SUPPLEMENTAL DATA).

PREFLIGHT INSPECTION



1. Cockpit -	
Gear Switch	DOWN
Magneto/Starter Switch	OFF
Master Switch	ON
All Rocker Switches	OFF
Circuit Breakers	IN
Internal/External Lights	CHECK Operation
Fuel Gauges, Quantity	CHECK
Pitot Heat Switch	ON (Check Pitot Heat Annunciator- Illuminated)
Fuel Selector R:	PULL gascolator ring (5 seconds)
Fuel Selector L:	PULL gascolator ring (5 seconds)

2. Right Fuselage/Tailcone -	
Instrument Static Port	UNOBSTRUCTED
General Skin Condition	INSPECT
Access Panels	SECURED
Tail tiedown	REMOVE

3. Empennage -	
Elevator and rudder attach points and control linkage attachments	INSPECT
Empennage security	INSPECT (lift on rudder)
General skin condition	INSPECT
	Remove ice, snow or frost.

4. Left Fuselage/Tailcone -	
Fresh Air Vent (on dorsal fin)	CLEAR
Instrument Static Port	UNOBSTRUCTED
General Skin Condition	INSPECT
Tailcone/Empennage Access Door	SECURED
Static System Drain	Push Plunger UP (Hold 3-5 Seconds)

**SECTION IV
NORMAL PROCEDURES**

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5. Left wing -	
General Skin Condition	INSPECT - Remove ice, snow or frost.
Wing Flap and attach points	INSPECT
Aileron and attach points	INSPECT
Control Linkages	INSPECT
Wing Tip, Lights & Lens	INSPECT
Tank Vent	UNOBSTRUCTED
Pitot Tube	UNOBSTRUCTED (Heat Element Operative)
Landing/Taxi Lights	INSPECT lens & bulbs
Stall Switch Vane	UNOBSTRUCTED-Check operation
Fuel Tank	CHECK QUANTITY (SECURE CAP)

| NOTE |

The anti-siphon fuel filler will trap fuel in the filler neck. Always push bottom of filler open when filling tank and when checking fuel.

| NOTE |

The visual fuel quantity gauge is to be used for partial refueling purposes only; DO NOT use for preflight check.

Tiedown	REMOVE
Wheel Chock	REMOVE
Left Main Gear, Shock Discs, Tire, Doors & Linkage	INSPECT
Fuel Tank Sump Drain	DRAIN Until Clear
Pitot System Drain	Push plunger UP (Hold for 3-5 seconds)
Gascolator Drain Valve	CLOSED (Check for drips)

6. Left Cowl Area -	
Windshield	CLEAN
Cabin Air Inlet	Unobstructed
Left Side Engine Cowl Fasteners	SECURED
Cowl Flap	INSPECT
Engine Oil	CHECK QUANTITY (Maximum 8 qts.) (7.6 liters) (Minimum 5 qts.) (4.3 liters)

Oil Filler Cap	PROPER POSITION/SECURED
Winterization Kit (If Installed)	
OAT - 30° F or below	CHECK hinged oil cooler cover in horizontal (or DOWN) position if use is desired.
OAT - above 30° F	Hinged oil cooler cover MUST be secured by clip fastener in vertical (or UP) position.

7. Propeller/Spinner & Front Cowl -	
Blades	INSPECT for nicks, cracks and oil leaks.
Spinner	INSPECT for security, cracks
Cooling Air Intakes	UNOBSTRUCTED
Nose Gear, Shock Discs, Tire, Doors & Linkage	INSPECT
Nose Wheel Chock	REMOVE

8. Right Cowl Area -	
Right Side Engine Cowl Fasteners	SECURED
Engine Induction Air Inlet Duct	UNOBSTRUCTED
Exhaust Pipe	SECURED
Windshield	CLEAN
Cabin Air Inlet	UNOBSTRUCTED

9. Right Wing -	
Fuel Tank Sump Drain	DRAIN until clear
Right Main Gear, Shock Discs, Tire, Doors & Linkage	INSPECT
Wheel Chock	REMOVE
Tiedown	REMOVE
Fuel Tank	CHECK QTY (Secure Cap)

| NOTE |

The anti-siphon fuel filler will trap fuel in the filler neck. Always push bottom of filler open when filling tank and when checking fuel.

| NOTE |

The visual fuel quantity gauge is to be used for partial refueling purposes only; DO NOT use for preflight check.

Landing/Taxi Lights	INSPECT lens & bulbs
Tank Vent	UNOBSTRUCTED
Wing Tip, Lights & Lens	INSPECT
Aileron and attach points	INSPECT
Control Linkages	INSPECT
Wing Flap and attach points	INSPECT
General Skin Condition	INSPECT-Remove ice, snow or frost

10. Baggage Door (check handle operation) SECURED

RETURN TO COCKPIT - MASTER/ROCKER SWITCHES OFF

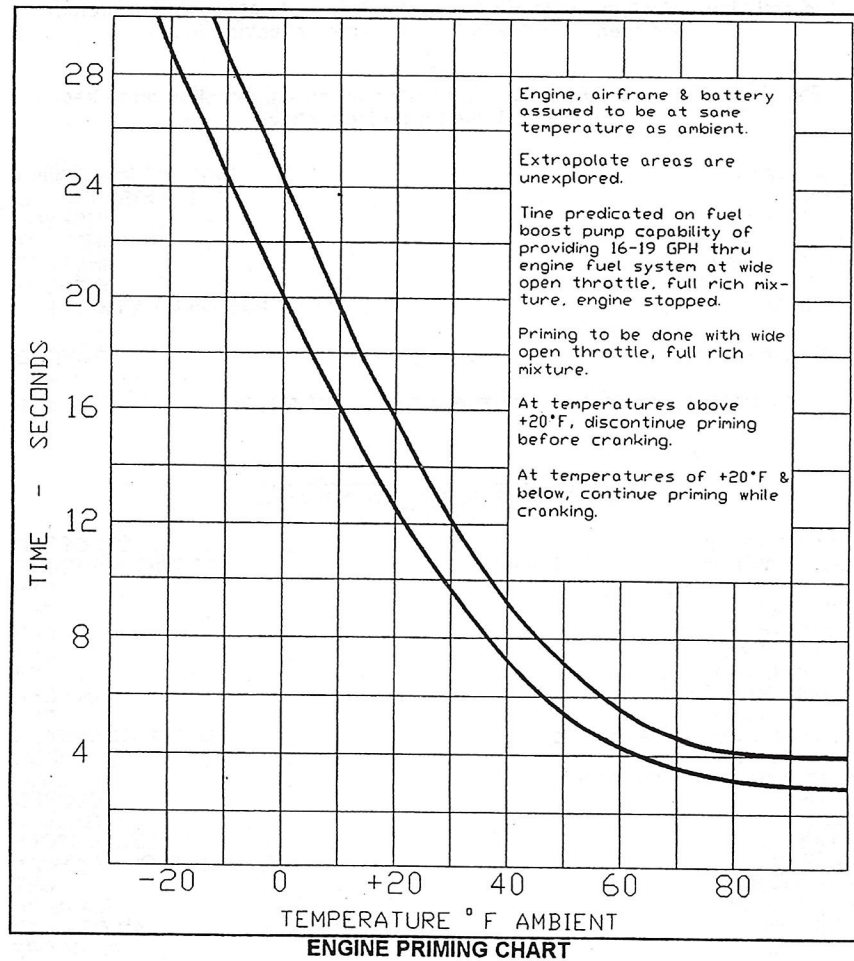
BEFORE STARTING CHECK

Preflight Inspection	COMPLETED
Seats, Seat Belts and Shoulder Harness	ADJUST & SECURE
Magneto/Starter Switch	OFF
Master Switch	OFF
Alternator Field switch(es)	OFF
Radio Master Switch	OFF
Fuel Boost Pump	OFF
Alternate Static Source	Push OFF
Rocker Switches	OFF
Directional Gyro (slave/free switch)	SLAVED (if installed)
Circuit Breakers	CHECK
Emergency Locator Transmitter	ARM
Throttle	CLOSED
Propeller	HIGH RPM
Mixture	IDLE CUTOFF
Cowl Flap	Verify Switch in OPEN position
Parking Brakes	SET
Wing Flap Switch	FLAPS UP
Cabin Vent	AS DESIRED
Cabin Heat	PUSH OFF
Defrost	PUSH OFF
Fuel Selector	FULLEST TANK
Radio Blower	CHECK - Master Sw. ON then OFF
Landing Gear Switch	DOWN
RED Emergency Gear Extension Handle	DOWN & LATCHED
Internal Lights	OFF
Passengers	Emergency/General Information briefing - COMPLETED

REFER TO SECTION IX FOR OPTIONAL EQUIPMENT CHECK PROCEDURES

Obtain local information prior to engine start.

ENGINE START



~ CAUTION ~

When battery will not start engine, inspection should be conducted to determine reason. If determination is made that battery voltage is low, servicing of battery is essential and charging for at least one hour should be done before engine is started. The battery or other electrical circuits may be damaged if aircraft is operated with a low battery.

| NOTE |

When starting engine using an approved external power source, no special starting procedure is necessary. Use normal starting procedures. (Auxiliary Power Cable Adapter is available from Mooney Aircraft Corporation). Battery SHOULD NOT BE COMPLETED DEPLETED when engine is to be started using an external power source.

Before Starting Checklist	COMPLETED
Throttle	FULL OPEN while priming, then retard to 1/4 OPEN
Cowl Flap	OPEN
Propeller	FULL FORWARD
Mixture	FULL FORWARD
Master Switch	ON
Annunciator Lights	PRESS TO TEST
Primer	ON (See Engine Priming Chart)

| NOTE |
At temperatures below 20° F. (-7° C), continue priming, while cranking, until engine starts.

Propeller Area	CLEAR
Magneto/Starter Switch	TURN and PUSH to START release to BOTH when engine starts.

| NOTE |
"START POWER" warning light should illuminate when Magneto/Starter Switch is in "START" position

Additional prime if engine does not continue to run.

| NOTE |
Cranking should be limited to 30 seconds and several minutes allowed between cranking periods to permit starter to cool.

Throttle	Set at 1000 to 1200 RPM
* Engine Oil Pressure	CHECK in Green Arc
* If MINIMUM OIL PRESSURE if not indicated within 30 seconds,	STOP ENGINE and determine problem.
* Alternator Field Switch(es)	ON
* Ammeter	CHECK
	(Turn LDG LT ON and observe Negative movement of needle)
* Fuel Flow Indicator	TEST/RESET (if desired)

~ CAUTION ~
Do not operate engine at run-up speed unless the oil temperature is 75° F. minimum. Operation of engine at too high a speed before reaching minimum oil temperature may cause loss of oil pressure.

FLOODED ENGINE START

Fuel Boost Pump	OFF
Throttle	FULL FORWARD
Mixture	IDLE CUTOFF
Magneto/Starter Switch	TURN and PUSH to START release to both when engine starts.
Mixture	FULL FORWARD
Throttle	Retard to 1200 RPM

* See Remaining "Engine Start" Procedure above.

WARM ENGINE START

Fuel Boost Pump	OFF
Throttle	Slightly open
Mixture	FULL FORWARD
Magneto/Starter Switch	TURN and PUSH to START
	release to BOTH when engine starts.
Throttle	1000 to 1200 RPM

* See Remaining "Engine Start" Procedure above.

BEFORE TAXI

Engine Start Checklist	COMPLETED
Radio Master Switch	ON
External Lights	As desired
Directional Gyro	SET or SLAVE SWITCH - ON
Instruments	Normal Operation
Radios	CHECK (Set Frequencies)
Altimeter	SET
Fuel Selector	SWITCH TANKS; verify engine runs on other tank
Cowl Flap	CHECK OPERATION, FULL OPEN or A/R
Optional Equipment Checks	Reference SECTION IX

[NOTE]

During cold weather, ground operations may be conducted with the cowl flap positioned partially or fully closed to help keep engine temperatures in normal operating ranges prior to takeoff. However, if cowl flap is fully closed, monitor engine temperatures to avoid exceeding maximum allowable limits.

TAXI

~ CAUTION ~

To prevent battery depletion in prolonged taxi or holding position before takeoff, increase RPM until "AMMETER" indicates positive charge.

Before Taxi Checklist	COMPLETED
Parking Brake	Release
Brakes	Check during Taxi
Directional Gyro	Proper indication during turns
Turn Coordinator	Proper indication during turns
Artificial Horizon	Erect during turns
Throttle	Minimum power
Cowl Flap	FULL OPEN or As Desired
Propeller	FULL FORWARD

BEFORE TAKEOFF

Taxi Checklist	COMPLETED
Parking Brake	SET
Fuel Selector	FULLEST TANK
Throttle	1200 RPM
Propeller	HIGH RPM
Mixture	Full Forward
Cowl Flap	OPEN or AS REQUIRED to keep engine temperatures in normal operating ranges.
Alternate Air	VERIFY CLOSED
Alternator Field Switch(es)	Verify ON
Oil Temperature	75° F minimum (24° C) (Needle moves off white dot)

Throttle 1700 RPM
Magnetos CHECK
Both to L, Both to R, Both
(Maximum 150 RPM drop each magneto, 50 RPM Difference)

[NOTE]

An absence of RPM drop may be an indication of faulty magneto grounding or improper timing. If there is doubt concerning ignition system operation, RPM checks at a leaner mixture setting or higher engine speed will usually confirm whether a deficiency exists.

Propeller	CYCLE/return to high RPM(3 times)
Ammeter	CHECK-Positive charge indication.
Throttle	Retard to IDLE RPM
Trim	TAKEOFF setting
Wing Flaps	Check operation. SET TAKEOFF POSITION (10 Degrees)
Flight Controls	Check free and correct movement
Cabin Door	CHECK SECURED
Seat Belts/Safety Harness	SECURED
Avionics and Auto Pilot	CHECK (Refer to SECTION IX)
Annunciator Lights	CHECK
Internal/External Lights	As Desired
Rotating Beacon/Strobe Lights	ON
Pilots Storm Window	CLOSED
Emergency Gear Extension (RED) Handle	DOWN and LATCHED
Parking Brake	Release

TAKEOFF

Before Takeoff Checklist COMPLETED

~ CAUTION ~

The ENGINE OIL MUST BE WARM, at least 100° F (38° C) (bottom of green arc) before takeoff, to assure proper turbocharger operation. The engine must not be operated at high power until the oil has reached this temperature.

If the turbocharger and its controlling system are properly rigged, manifold pressure will increase to 39.0 In. Hg. when the throttle is full open. However, during cold weather operations, a full throttle takeoff may result in a 1.0 to 2.0 In. Hg. increase in manifold pressure above the 39.0 In. Hg. allowable limit. This condition is allowed for short periods of time only (under 2 minutes). If this slight overboost occurs at full throttle, reduce the throttle slightly (within the 2 minute limit) to obtain the recommended 39.0 In. Hg. maximum power manifold pressure setting.

Proper engine operation should be checked early in the takeoff roll. Any significant indication of rough or sluggish engine response is reason to discontinue the takeoff.

When takeoff must be made over a gravel surface, it is important that the throttle be applied slowly. This will allow the aircraft to start rolling before a high RPM is developed, and gravel or loose material will be blown back from the prop area instead of being pulled into it.

TAKEOFF (NORMAL)

Fuel Boost Pump	VERIFY OFF
Alternate Air	CLOSED
Parking brake	OFF
Engine Oil temperature	100° F (38° C) MINIMUM
Power	39.0" MP and 2600 RPM
Engine Instruments	Check proper indications
Liftoff/Climb Speeds	As specified in SECTION V (Takeoff Distances)
Landing Gear	RETRACT IN CLIMB after clearing obstacle
Wing Flaps	UP

~ CAUTION ~

| NOTE |

| NOTE |

| NOTE |

CLIMB (CRUISE)

CLIMB (BEST RATE) - (V_V)

CLIMB (BEST ANGLE) - (V_v)

CRUISE

| NOTE |

| NOTE |

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////////////////////
/// WARNING ///

Continuous operation with TIT in excess of 1650° F is prohibited for all conditions. Leaning to a TIT of 1700° F for a maximum of 30 seconds is permitted.

Engine Instruments

CHECK

| NOTE |

Careful leaning of the mixture control will result in maximum possible fuel efficiency. This requires operating at peak TIT for the power setting being used. Failure to do so will result in excessive fuel burn. After leveling off at cruise altitude, set MP and RPM for desired power setting per Cruise Power Chart, SECTION V. Slowly lean Mixture until TIT reaches peak value. TIT indications become sensitive as peak is approached; careful adjustments are necessary for accurate settings. Changes in altitude or power MAY require readjustment of TIT.

Cowl Flap

AS REQUIRED

to maintain cylinder head and oil temperatures in their normal operating ranges.

~~~~~  
~ CAUTION ~

When cruising in conditions where OAT is well above standard or at very high altitudes, it may be necessary to OPEN cowl flap to as much as 1/4 open in order to keep engine temperatures within operating limits. When cowl flap is OPEN during cruise the following effects on cruise speed will result:

Cowl Flap - 1/4 Open (Indicator positioned at first index)

Approx. loss in TAS . . . . .

.( 2 ) KTS

Cowl Flap - 1/2 Open (Indicator positioned at second index)

Approx. loss in TAS . . . . .

.( 4 ) KTS

## | NOTE |

During high OAT, a very low fluctuation in fuel flow may occur. If this occurs, proceed as follows:

Low Boost Pump . . . . .

Fuel Flow . . . . .

Low Boost Pump . . . . .

Engine temperatures . . . . .

ON

MONITOR

OFF

If condition persists, repeat procedure above.

STABILIZE

at cruise condition (approximately 5 minutes).

////////////////////  
/// WARNING ///

Do not use HIGH BOOST PUMP unless engine driven fuel pump has failed. See emergency procedures for operation of High Boost Pump.

When increasing power always return mixture to full rich, then increase RPM before increasing manifold pressure; when decreasing power decrease manifold pressure before reducing RPM. Always stay within the established operating limits, and always operate the controls slowly and smoothly.



### FUEL TANK SELECTION

Boost Pump . . . . . ON  
Fuel Selector . . . . . SELECT OPPOSITE TANK  
Boost Pump . . . . . OFF - (Observe fuel pressure gauge for proper pressure reading.)

### DESCENT

#### NOTE

Avoid extended descents at manifold pressure settings below 20 in. Hg. as the engine can cool excessively and may not accelerate satisfactorily when power is re-applied. Additionally, leaning mixture to peak TIT during descent will save fuel and will eliminate engine roughness associated with an overly rich mixture setting. During descent engine MP will tend to increase as aircraft loses altitude. Occasional power reductions with the throttle may be required to maintain original descent manifold pressure setting.

#### Normal Descent (Gear Up)

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| Seats, Seat Belt/Shoulder Harness | ADJUST AND SECURE                 |
| Wing Flaps                        | UP                                |
| Landing Gear                      | UP                                |
| Throttle                          | ABOVE 20 in. Hg. MP               |
| Propeller                         | 2200 RPM                          |
| Mixture                           | PEAK TIT                          |
| Cowl Flap                         | CLOSED                            |
| Cylinder Head Temperature (CHT)   | Monitor (250° F (121° C) minimum) |
| Airspeed                          | AS DESIRED (196 KIAS Max.)        |

#### NOTE

Plan descents to arrive at pattern altitude on downwind leg for maximum fuel efficiency and minimum aircraft noise.

#### Normal Descent (Gear Down)

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Seats, Seat Belts/Shoulder Harness | ADJUST AND SECURE                 |
| Airspeed                           | DECELERATE to 140 KIAS            |
| Landing Gear                       | DOWN                              |
| Throttle                           | ABOVE 20 in. Hg. MP               |
| Propeller                          | 2200 RPM                          |
| Mixture                            | PEAK TIT                          |
| Cowl Flap                          | CLOSED                            |
| Cylinder Head Temperature (CHT)    | MONITOR (250° F (121° C) minimum) |
| Airspeed                           | 165 KIAS or less                  |

#### NOTE

Using the landing gear as a descent aid will result in a steeper descent rate (greater altitude loss per horizontal distance traveled).

### APPROACH FOR LANDING

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Seat Belts/Shoulder Harness | ADJUST AND SECURE                          |
| Internal/External Lights    | As desired                                 |
| Landing Gear                | EXTEND (below 140 KIAS)                    |
|                             | (Gear down light ON - Check visual indica- |
| tor)                        |                                            |
| Mixture                     | FULL RICH                                  |
| Propeller                   | HIGH RPM                                   |
| Fuel Boost Pump             | OFF                                        |
| Fuel Selector               | FULLEST TANK                               |



|                      |                |
|----------------------|----------------|
| Wing Flaps           | AS DESIRED     |
| Wing Flaps FULL DOWN | Below 112 KIAS |

~ CAUTION ~

To minimize control wheel forces when entering landing configuration, timely nose-up trimming is recommended to counteract nose down pitching moment caused by reduction of power and/or extension of flaps.

|               |            |
|---------------|------------|
| Trim          | As desired |
| Parking Brake | VERIFY OFF |

| NOTE |

The parking brake should be rechecked to preclude partially applied brakes during touchdown

**GO AROUND (BALKED LANDING)**

~ CAUTION ~

To minimize control wheel forces during GO-AROUND, timely nose-down trimming is recommended to counteract nose up pitching moment as power is increased and/or flaps are retracted.

|              |                                          |
|--------------|------------------------------------------|
| Power        | 39.0" MP and 2600 RPM                    |
| Mixture      | VERIFY FULL RICH                         |
| Wing Flaps   | TAKEOFF position After climb established |
| Trim         | NOSE DOWN to reduce force                |
| Airspeed     | Accelerate to 77 KIAS                    |
| Landing Gear | RETRACT                                  |
| Wing Flaps   | RETRACT                                  |
| Cowl Flap    | OPEN                                     |
| Airspeed     | Accelerate to 94 KIAS                    |

**LANDING**

**LANDING (NORMAL)**

|                                |                                             |
|--------------------------------|---------------------------------------------|
| Approach for Landing Checklist | COMPLETED                                   |
| Approach Airspeed              | As specified in SECTION V, Landing Distance |
| Touchdown                      | Main wheels first(Aligned with Runway)      |
| Landing Roll                   | Lower nose wheel gently                     |
| Brakes                         | Minimum required                            |

| NOTE |

Landing information for reduced flap settings are not available.  
See SECTION V for Landing Distance tables.

| NOTE |

If maximum performance landings are desired, use above procedures except, reduce approach airspeed to 69 KIAS (flaps Full Down) and apply maximum braking (without skidding tires) during rollout.

**[ NOTE ]**

Cross wind landings should be accomplished by using the above procedures except maintain approach speed appropriate for wind conditions. Allow aircraft to crab until the landing flare. Accomplish touchdown in a slight wing low sideslip (low wing into wind) and aircraft aligned with runway. During landing roll, position flight controls to counteract crosswind.

**~ CAUTION ~**

The landing gear may retract during landing roll if landing gear switch is placed in the UP position.

**TAXI AFTER LANDING**

|                          |                  |
|--------------------------|------------------|
| Throttle                 | 1000 to 1200 RPM |
| Flaps                    | RETRACT          |
| Cowl Flap                | OPEN             |
| Trim                     | RESET to Takeoff |
| Avionics/Radios          | AS REQUIRED      |
| Internal/External Lights | AS REQUIRED      |

**SHUTDOWN**

**~ CAUTION ~**

Operate the engine at idle (below 1200 RPM) for 5 minutes to allow the TURBOCHARGER TO COOL. Taxi time after landing may be considered as part of the 5 minutes.

|                             |                           |
|-----------------------------|---------------------------|
| Parking Brake               | SET                       |
| Throttle                    | IDLE RPM                  |
| Radio Master                | OFF                       |
| All Electrical Equipment    | OFF                       |
| Magneto/Starter Switch      | GROUNDING CHECK           |
| Mixture                     | IDLE CUTOFF               |
| Magneto/Starter Switch      | OFF(when propeller stops) |
| Alternator Field Switch(es) | OFF                       |
| Master Switch               | OFF                       |
| Oxygen System (if equipped) | OFF                       |

**SECURING AIRCRAFT**

|                        |                               |
|------------------------|-------------------------------|
| Magneto/Starter Switch | VERIFY OFF/Key removed        |
| Master Switch          | VERIFY OFF                    |
| Radio Master           | VERIFY OFF                    |
| Electrical Switches    | VERIFY OFF                    |
| Parking Brake          | RELEASE; install wheel chocks |

**For extended parking:**

|                         |                                                |
|-------------------------|------------------------------------------------|
| Control wheel           | SECURED with seat belts,<br>cabin vents closed |
| Interior Light Switches | VERIFY OFF                                     |

TIE DOWN AIRCRAFT at wing and tail points