

BEFORE STARTING ENGINE

Preflight Inspection	Carried Out
Doors	CLOSED
Main Switch	OFF
Parking Brake	SET
Seats, Seatbelts, Shoulder Harness	SECURE
Flight Controls	CHECK
Pitch Trim	CHECK DEFLECTION
Fuel Selector	OPEN
Circuit Breakers	IN
Magneto Switch	OFF
Radio Master	OFF

ENGINE STARTING

Carburator Heat	OFF
Propeller	FULL FORWARD
Mixture	FULL RICH
Main Switch	ON
Fuel Pump	ON
Injection	A FEW TIMES
Pump Warning Light	ON
Fuel Pressure	GREEN
Throttle	1/4 OPEN
Area	CLEAR
Magneto/Start Switch	START

After Starting Engine

Magneto Swith	BOTH
Oil Pressure	GREEN

Failed Starting

Mixture	IDLE-CUT OFF
Throttle	FULL POWER
Magneto/Start Switch	START

AFTER STARTING ENGINE

Alternator Switch	OFF
Generation Warning Light	ON
Voltmeter	YELLOW
Alternator Switch	ON
Generation Warning Light	OFF
Voltmeter	GREEN
Turn and Bank Coordinator	ON
Suction Gage	CHECK
Anti-Collision Light	ON
Alarm Panel Test	POSITIVE
Radio Master	ON
All Radios and Nav aids	ON
Transponder	ON
Fuel Selector	FULLEST TANK
Flaps	RETRACTED

TAXIING

Parking Brake	RELEASE
Brakes	CHECK
Flight Instruments	CHECK
Engine	UP TO 1200 RPM

ENGINE RUN-UP

Parking Brake	SET
Engine Controls Friction	ADJUST
Oil Temperature	GREEN
Oil Pressure	GREEN
Fuel Pressure	GREEN
Mixture	FULL RICH
Carburator Heat	OFF
Fuel Selector	FULLEST TANK
Propeller	FULL FORWARD
Throttle	2000RPM
Propeller Cycle (500RPM DROP)	TWICE
Throttle	2000RPM
Magneto Switch	LEFT>BOTH then RIGHT>BOTH
	Maximum RPM Drop Each 175RPM
	Maximum difference 50RPM
Carburator Heat	ON
Manifold Pressure	DECREASE
Carburator Temperature	INCREASE
Full Throttle	2700RPM
Throtlle	IDLE
Throtlle	1000RPM

BEFORE TAKE-OFF

Seats, Seatbelts, Shoulder Harness	SET
Doors	ADJUST
Controls	FREE
Pitch-Trim	TAKE-OFF
Flaps	TAKE-OFF
Magneto Switch	BOTH
Propeller	FULL FORWARD
Carburator Heat	OFF
Mixture	FULL RICH
Fuel Selector	FULLEST TANK
Fuel Pump	ON
Oil Temperature	GREEN
Oil Pressure	GREEN
Fuel Pressure	GREEN
Voltmeter	GREEN
Altimeter	SET
Directional Gyro	SET
Horizontal Attitude Gyro	SET
Parking Brake	RELEASE

Cabin Blower	OFF
Landing Lights	
Navigation Lights	
Transponder	ON

TAKE-OFF

Runway Line-up	SET GYRO
	<i>Standard Airspeeds</i>
Rotation	65 KIAS
Initial Climb	67 KIAS
	<i>When Safely Airborne</i>
Brakes	APPLY
Climb Speed	73 KIAS
Flaps	RETRACT
Fuel Pump	OFF
Landing Lights	
Navigation Lights	

CLIMB

Mixture	FULL RICH
Throttle	FULL POWER
Propeller	FULL FORWARD
Optimum Climb Speed	78 KIAS

AFTER LANDING

Fuel Pump	OFF
Flaps	RETRACT
Landing Lights	OFF
Trim	TAKE-OFF
Pitot Heat	OFF
Carburator Heat	OFF

SHUT-DOWN

Parking Brake	SET
Turn and Bank Coordinator	OFF
Anti-Collision Light	OFF
Navigation Lights	OFF
All Radios and Nav aids	OFF
Radio Master	OFF
Throttle	REDUCED
Magnetos Cut-Off Test	OFF then BOTH
Throttle	1000RPM
Mixture	IDLE CUT-OFF

After Engine Stops

Magneto Switch	OFF
Alternator Switch	OFF
Main Switch	OFF
Fuel Selector	OFF
Controls	LOCK

TAXIING

Parking Brake	RELEASE
Brakes	CHECK
Flight Instruments	CHECK
Engine	UP TO 1200 RPM

ENGINE RUN-UP

Parking Brake	SET
Engine Controls Friction	ADJUST
Oil Temperature	GREEN
Oil Pressure	GREEN
Fuel Pressure	GREEN
Mixture	FULL RICH
Carburator Heat	OFF
Fuel Selector	FULLEST TANK
Propeller	FULL FORWARD
Throttle	2000RPM
Propeller Cycle (500RPM DROP)	TWICE
Throttle	2000RPM
Magneto Switch	LEFT>BOTH then RIGHT>BOTH
	Maximum RPM Drop on Ea 175RPM
	Maximum difference betwe 50RPM
Carburator Heat	ON
Manifold Pressure	DECREASE
Carburator Temperature	INCREASE
Full Throttle	2700RPM
Throttle	IDLE
Throttle	1000RPM

BEFORE TAKE-OFF

Seats, Seatbelts, Shoulder Harness	SET
Doors	ADJUST
Controls	FREE
Pitch-Trim	TAKE-OFF
Flaps	TAKE-OFF
Magneto Switch	BOTH
Propeller	FULL FORWARD
Carburator Heat	OFF
Mixture	FULL RICH
Fuel Selector	FULLEST TANK
Fuel Pump	ON
Oil Temperature	GREEN
Oil Pressure	GREEN
Fuel Pressure	GREEN
Voltmeter	GREEN
Altimeter	SET
Directional Gyro	SET
Horizontal Attitude Gyro	SET

Parking Brake	RELEASE
Cabin Blower	OFF
Landing Lights	
Navigation Lights	
Transponder	ON

TAKE-OFF

Runway Line-up	SET GYRO
<i>Standard Airspeeds</i>	
Rotation	65 KIAS
Initial Climb	67 KIAS
<i>When Safely Airborne</i>	
Brakes	APPLY
Climb Speed	73 KIAS
Flaps	RETRACT
Fuel Pump	OFF
Landing Lights	
Navigation Lights	

CLIMB

Mixture	FULL RICH
Throttle	FULL POWER
Propeller	FULL FORWARD
Optimum Climb Speed	78 KIAS

AFTER LANDING

Fuel Pump	OFF
Flaps	RETRACT
Landing Lights	OFF
Trim	TAKE-OFF
Pitot Heat	OFF
Carburator Heat	OFF

SHUT-DOWN

Parking Brake	SET
Turn and Bank Coordinator	OFF
Anti-Collision Light	OFF
Navigation Lights	OFF
All Radios and Nav aids	OFF
Radio Master	OFF
Throttle	REDUCED
Magnetos Cut-Off Test	OFF then BOTH
Throttle	1000RPM
Mixture	IDLE CUT-OFF
<i>After Engine Stops</i>	
Magneto Switch	OFF
Alternator Switch	OFF
Main Switch	OFF
Fuel Selector	OFF

Controls
Checks

LOCK
PUT

BEFORE STARTING ENGINE

Preflight Inspection	CARRIED OUT
Doors	CLOSED
Parking Brake	SET
Seats, Seatbelts, Shoulder Harness	SECURE
Flight Controls	CHECK
Pitch Trim	CHECK DEFLECTION & Neutral
Alternate Static Source	Check OFF
Fuel Selector	Desired TANK
Carburetor Heat	FULL GOLD
Magneto Switch	OFF
Avionics - Radio	OFF
Circuit Breakers	IN

ENGINE STARTING

Throttle	1/4 OPEN
Battery Master Switch	ON
Alternator Switch	ON
Magnetos Left & Right	ON
Electric Fuel Pump	ON
Mixture	FULL RICH
Fuel Pressure	GREEN
Propeller Area	CLEAR
Starter	ENGAGED
Throttle	ADJUST
<i>After Starting Engine</i>	
Oil Pressure	Check within 30" GREEN
Magneto Switch	Check LEFT & RIGHT ON
Alternator Switch	Check ON

Failed Starting

Mixture	IDLE-CUT OFF
Throttle	FULL POWER
Magneto/Start Switch	START

AFTER STARTING ENGINE

Electric Fuel Pump	OFF
Fuel Pressure	GREEN
Master Avionics	ON
Avionics & Radio	As Required and TEST
Heading Indicator	Set with Magnetic Compass
Attitude Indicator	ADJUST
Altitude Indicator	SET and Check Altitude + 75'
Suction Gage	CHECK
Strobe Lights	ON
Navigation Light	As required
Taxi & Landing Lights	As required
Voltemeter	CHECK
Transponder	STAND-BY
Flaps	RETRACTED
Steering & Turn Coordinator	CHECK

TAXIING

Parking Brake	RELEASE
Brakes	CHECK
Steering & Turn Coordinator	CHECK Deflection
Engine	UP TO 1200 RPM

ENGINE RUN-UP

Parking Brake	SET
Engine Controls Friction	ADJUST
Oil Temperature	GREEN
Oil Pressure	GREEN
Fuel Pressure	GREEN
Mixture	FULL RICH
Carburetor Heat	OFF
Fuel Selector	FULLEST TANK
Throttle	2000RPM
Magneto Switch	LEFT>BOTH then RIGHT>BOTH
Maximum RPM Drop Each 175 RPM	
Maximum difference 50 RPM	
Maximum difference 50 RPM	
Carburetor Heat	FULL HEAT

CHECK RPM Approx. 75 RPM drop

Suction Gage	4.8 to 5.2 in. Hg
Oil Pressure	Check within 30" GREEN
Altimeter	CHECK
Annunciator Panel	PRESS TO TEST
Carburetor Heat	ON approx. 75RPM drop then FULL GOLD
Elec. Fuel Pump	ON & OFF CHECK FUEL PRESSURE
Throttle	RETARD CHECK RPM

BEFORE TAKE-OFF

Battery Master Switch	Verify ON
Alternator Switch	Verify ON
Magnetos	Verify ON
Flight Instrument	CHECK
Fuel Selector	Proper TANK
Elec. Fuel Pump	ON
Engine Gauges	CHECK
Carburetor Heat	OFF
Mixture	FULL RICH
Seat Backs	ADJUST
Seat	Adjust and Lock in Position
Belts / Harness	Fastened CHECK
Empty Seats	Seat Belts Securely Fastened
FLAPS	SET
TRIM	NEUTRAL
Controls	FREE
Heading & Altitude Indicator (Gyros)	Check
DOOR	LATCHED
Parking Brake	RELEASE

Landing Lights	CHECK ON
Navigation Lights	CHECK ON
Transponder	ALT

TAKE-OFF

Runway Line-up	CHECK GYRO
<i>Standard Airspeeds</i>	
Rotation	65 KIAS
<i>When Safely Airborne</i>	

Brakes	APPLY
Climb Speed	80 KIAS
Flaps	RETRACT
Fuel Pump	OFF at desired altitude

CRUISING

Carburetor Heat	SET per Power Table
Mixture	ADJUST
Landing Lights	OFF
Fuel Pump	OFF

CLIMB

Throttle	FULL POWER
Best Rate	76 KIAS
Best Angle	64 KIAS
Electric Fuel Pump	OFF at desired altitude

AFTER LANDING

Fuel Pump	OFF
Flaps	RETRACT
Landing Lights	OFF
Trim	TAKE-OFF
Pitot Heat	OFF
Carburetor Heat	OFF

SHUT-DOWN

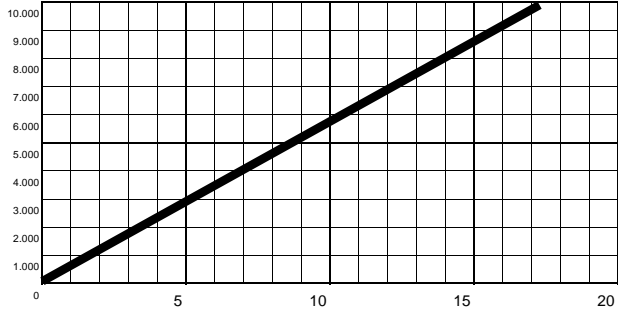
Parking Brake	SET
Turn and Bank Coordinator	OFF
Anti-Collision Light	OFF
Navigation Lights	OFF
All Radios and Nav aids	OFF
Radio Master	OFF
Throttle	REDUCED
Magnetos Cut-Off Test	OFF then BOTH
Throttle	1000RPM
Mixture	IDLE CUT-OFF

After Engine Stops

Magneto Switch	OFF
Alternator Switch	OFF
Main Switch	OFF
Fuel Selector	OFF
Controls	LOCK

MAXIMUM GLIDE

Speed 85 KIAS - Propeller Windmilling
Flaps Up - Zero Wind



TOTAL FUEL : 55.4 U.S.Gallons (210 lt)

USABLE FUEL : 53.8 U.S.Gallons (204 lt)

V _{NE} Never Exceed Speed	165
V _{FE} Max.Flap Extended Speed	95

STALLING SPEEDS

CONFIGURATION	BANK					
	0		30		45	
	KIAS	MPH IAS	KIAS	MPH IAS	KIAS	MPH IAS
FLAPS RETRACTED	60	70	65	75	72	83
FLAPS TAKE-OFF	57	66	62	71	58	78
FLAPS LANDING	53	61	57	66	63	73

AIR SPEED FOR SAFE OPERATION

Stall Speeds		
2550 lbs (0 flaps)	50	KIAS
2550 lbs (full flaps)	45	KIAS
Maneuvering Speeds		
2550 lbs	113	KIAS
1634 lbs	89	KIAS
Never Exceed Speed	154	KIAS
Power OFF Glide Speed		
2550 lbs (0 flaps)	76	KIAS

ENGINE FIRE DURING START

Starter	Crank Engine
Mixture	Idle Cut-Off
Throttle	OPEN
Electric Fuel Pump	OFF
Fuel Selector	OFF
Abandon if fire continues	ON

ENGINE POWER LOSS DURING TAKEOFF

If sufficient runway remains for a normal landing

land straight ahead

If insufficient runway remains

Maintain Safe Airspeed

Make Only Shallow turn to avoid obstructions

Flaps as situation requires

If sufficient altitude has been gained to restart

Maintain Safe Airspeed

Fuel Selector	Switch to tank containing fuel
Electric Fuel Pump	Check ON
Mixture	Check RICH
Carburetor heat	ON

If Power is not regained, proceed with power off landing

ENGINE POWER LOSS IN FLIGHT

IF at low altitude :

Airspeed	MAINTAIN 76 KIAS
	Minimum

IF altitude permits :

Fuel Selector	Switch to tank containing fuel
Electric Fuel Pump	Check ON
Mixture	Check RICH
Carburetor heat	ON
Engine Gauges	CHECK for indication of cause of power loss.

If no fuel pressure is indicated, check tank selector position to be sure it is on a tank containing fuel

When Power Restored :

Carburetor heat	OFF
Electric Fuel Pump	OFF

If power not restored prepare for power off landing

POWER OFF LANDING

TRIM	76 KIAS
Locate suitable field	
Establish spiral pattern	
When field can easily reached, slow to 66 KIAS	
Touchdowns should normally be made at lowest speed with full flaps	
FLAPS	ADJUST
Throttle	CLOSED
Mixture	Idle Cut-Off
Magnetos	OFF
Battery Master Switich	OFF
Alternator Switch	OFF
Fuel Selector	OFF
Seat Belts & Harness	TIGHT

FIRE IN FLIGHT

Source of Fire	CHECK
Electrical FIRE (Smoke in cabin) :	
Battery Master Switich	OFF
Alternator Switch	OFF
Vents	OPEN
Cabin heat	OFF
Land as soon as practicable	

Engine FIRE :

Fuel Selector	OFF
Throttle	CLOSED
Mixture	IDLE CUT-OFF
Electric Fuel Pump	Check OFF
Heater and Defroster	OFF

Proceed with Power off Procedure

LOSS OF OIL PRESSURE

Land as soon as possible and investigate cause	
Prepare for power off landing	

LOSS OF FUEL PRESSURE

Electric Fuel Pump	ON
Fuel Selector	Check on full TANK

HIGH OIL TEMPERATURE

Land as soon as possible and investigate cause	
Prepare for power off landing	

CARBURETOR ICING

Carburetor Heat	ON
Mixture	Adjust for maximum smoothness

OPEN DOOR

Airspeed slow	87 KIAS
Cabin Vents	CLOSE
Storm Window	OPEN
Upper Door latch	Check Latched
Door latch handle	Check Latched
IF both is open	Latch Side first and then top

ELECTRICAL FAILURES

ALT annunciator light illuminated :

Ammeter	Check to verify inop. Alt
If ammeter shows zero :	
ALT switch	OFF
Reduce electrical loads to minimum	
ALT circuit breakers	Check and Reset
ALT switch	ON
IF power not restored ALT switch	OFF

ELECTRICAL OVERLOADS

(Alternator is over 20 amps above known electrical load)

ALT switch	ON
BATTERY switch	OFF
If alternator loads are reduced :	
Electrical loads	Reduce to Minimum
Land as soon as practicable	
If alternator loads are NOT reduced :	
ALT switch	OFF
BATTERY switch	As Required
Land as soon as possible. Anticipate complete Electrical failure	

ENGINE ROUGHNESS

Carburetor Heat	ON
If roughness continues after 1 min :	
Carburetor Heat	OFF
Mixture	Adjust for maximum smoothness
Electric Fuel Pump	ON
Fuel Selector	Switch Tank
Engine Gauges	CHECK
Magneto switches	CHECK LEFT then RIGHT
If operation is satisfactory on either one, continue on that magneto at reduced power and full rich mixture to FIRST AIRPORT	
Prepare for power off landing	

Sea Level	ISA	2245	105	55%
Sea Level	ISA	2405	113	65%
Sea Level	ISA	2515	119	75%
2000	ISA	2280	106	55%
2000	ISA	2425	114	65%
2000	ISA	2545	121	75%
4000	ISA	2300	106	55%
4000	ISA	2450	115	65%
4000	ISA	2575	123	75%
6000	ISA	2320	107	55%
6000	ISA	2470	116	65%
8000	ISA	2320	107	55%
8000	ISA	2495	117	65%

