

**CHAPTER 5**  
**NORMAL FLOWS AND CHECKLISTS**

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## ***SOP EMPHASIS***

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### **MIXTURE GROUND-LEANING SOP**

Mixture shall be leaned during all ground operations to avoid spark plug fouling and associated problems. The following SOP will be used whenever the aircraft will be at idle power on the ground or taxiing for any amount of time.

#### **MIXTURE GROUND-LEANING SOP**

**NOTE**

When stationary, avoid idling engine below 800-1000 RPM to avoid spark plug fouling.

*THROTTLE..... 1200 RPM*  
*MIXTURE ..... LEAN UNTIL SLIGHT RISE IN RPM*  
*THROTTLE..... 1000 RPM*

**NOTE**

If engine roughness occurs, enrichen the mixture slightly until smooth.

### **FEET POSITIONING DURING TAXI, TAKEOFF AND LANDING SOP**

Improper feet positioning on the rudder pedals results in premature wear of brakes and tires. It also increases loss of control possibility during taxi, takeoffs and landings, particularly in crosswinds.

#### **Taxiing**

Avoid riding the brakes during taxi. When taxiing in a straight line, keep the feet off the brake portion of the pedals as much as practical. Reduce the power to idle before applying brakes if additional slowdown is required. Use nosewheel steering to turn first, and only apply additional brake in the direction of a turn when a tighter turn radius is desired.

#### **Takeoff and landing**

Keep feet entirely off the brakes during takeoff and landing. The balls of the feet should be positioned on the bottom part of the pedals for rudder control only. In this position even a full rudder deflection, if needed, will not engage the brake when the pedal is pressed.



**Figure 1: Proper feet position on the rudder pedals and not on brakes**

## **LIVE AIRCRAFT CONCEPT**

In order to allow in immediate visual confirmation if an aircraft on the ramp is “live”, that is, electrical system is activated for any reason, and/or engine start could be imminent, the BEACON LIGHT switch is to remain ON at all times.

*That includes all ground and flight operations, and when the aircraft is shut down and secured. The switch shall be left in the ON position after shutdown. The switch shall be confirmed in the ON position when starting preflight.*

## ***PREFLIGHT INSPECTION***

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### **General**

The complete preflight inspection is conducted prior to the first flight of the day and at any Pilot-in-Command changes. Flight crews should inspect the aircraft with the attitude that the aircraft must prove it is fit to fly, rather than doing so with the assumption that they are going and the airplane “is probably okay.”

### **Preflight inspection execution and verification**

Any inspection must strike a balance between speed and efficiency vs. thoroughness and safety.

When looking at airplane components and complex assemblies, inspect each component one by one. Look at each individual component in turn, rather than trying to take in the entire assembly all at once. Experience shows that looking at a complex assembly at once, rather than individual components, results in missing defective items.

For example, looking at “the gear” and trying to inspect “the gear”, rather than looking at each component of the gear in turn, such as brake pads, brake disk, etc., individually, will probably result in something being missed, such as cracks in the brake disk, leaks or worn out pads, etc.

Limit to 3 (three) or 4 (four) the amount of individual components inspected before verifying with the checklist in-hand. Research has shown that human working memory is limited to about 3 or 4 items at a time. Therefore inspect 3 or 4 items on the checklist, then look at the checklist to ensure nothing was missed, before moving on to the next 3 to 4 items.

If an attempt is made to inspect, for example, 10 items at once, and then verify the same 10 items on the checklist, the chances of missing an item increase dramatically. Since the working memory cannot hold all of those items at once, an item might be missed during the inspection. For example, item 5 was missed. Then, during the verification, since there are 10 items to verify, the individual will have forgotten by then that the item 5 was never actually inspected, since the working memory has “moved on”. As a result, despite the best efforts, using this system has resulted in missing a potentially critical item on the checklist.

*A smart pilot realizes limitations of the human mind and adjusts his/her technique accordingly.*

### **Deferring / securing preflight inspection items**

While it may be necessary to defer an item occasionally, it is never acceptable to leave a deferred item unattended and/or unsecured. For example, if oil level is checked, and it is determined that a quart of oil must be added, the oil dipstick must be reinstalled and the oil door secured while the pilot completes the rest of the preflight and/or goes in to get oil.

Not doing so runs the risk of forgetting and attempting to depart with an unsecured item, in this case, the oil dipstick.

Another potentially dangerous situation would be to leave a fuel cap off, for whatever reason, while performing other tasks. Never leave the fuel cap unsecured, and reinstall it each time when getting off the wing.

Yet another possibility exists when an object is placed on the surfaces of the aircraft, or next to it, rather than inside it, thinking that one will get it “later”, which may become “never”.

*A smart pilot realizes limitations of memory and, inasmuch as practical, always returns each airplane component to flight-ready status after inspection.*

### **Leaving a preflighted aircraft unattended**

While it may occasionally be necessary to leave a fully or partially preflighted aircraft, it is never acceptable to just “get in and go” when returning to it, either by the PUI who performed the inspection, or by the PIC/CFI who comes out to join the PUI.

The first consideration is safety and security of the personnel and aircraft on the ramp. The second consideration is to avoid missing any critical items (tie downs, chocks, foreign objects, unsecured doors, etc.) when returning to the aircraft.

Each pilot is responsible to complete his/her own total 360° walkaround of the aircraft to ensure that the aircraft is flight-ready before boarding.

### **Inspecting unfamiliar vs. previously flown aircraft (turnarounds)**

Any aircraft that has been newly assigned to the pilot deserves nothing less than the most careful and complete inspection. Until inspected, it is unknown if the aircraft is airworthy, or what was done with/to it during the preceding flight by someone else, or what may have happened to it on the ground overnight.

A situation where the same aircraft is inspected between flights (a turnaround) by the same PIC who has just flown the aircraft may allow for certain items, in the PIC’s judgment, to be de-emphasized. However, a diligent inspection must still be made of all critical items. The landing gear, tires, propeller, engine, oil, alternator, fuel, etc., have all been used, and although they were found acceptable prior to the previous flight, they may require attention now.

A good approach is to ask oneself what are the critical items, which items were used the most, what will be needed during the consequent flights, and concentrate on those, while paying attention to the overall condition of the aircraft.

#### **NOTE**

A walk-around shall be conducted during turnarounds by the same PIC in accordance with the Preflight Inspection checklist.

A walk-around shall be conducted by the CFI / PIC when coming out to, and prior to entering, any aircraft to be flown.

A walk-around shall be conducted by the flight crew, in accordance with the checklist, whenever the aircraft has been left unattended.

#### **NOTE**

**Both the preflight inspection and the walk-around shall be conducted with the checklist in-hand.**

**COCKPIT AND CABIN**

▶ AIRCRAFT ACCEPTANCE .....	COMPLETE
MAINTENANCE STATUS .....	VERIFIED / CLEARED
HOBBS / TACH METERS .....	VERIFIED / RECORDED
POH / AIRCRAFT DOCUMENTS .....	AVAILABLE / CHECKED
PARKING BRAKE .....	SET
CONTROL LOCK .....	REMOVED
FLIGHT CONTROLS .....	FREE / CORRECT
FIRE EXTINGUISHER.....	GREEN ARC / SECURED
FUEL SELECTOR (feel for detent) .....	EXERCISE, then BOTH
FUEL SHUTOFF VALVE .....	(full in) ON
TRIM WHEEL .....	EXERCISE, then TAKEOFF
CARBON MONOXIDE DETECTOR .....	CHECK DATE
MIXTURE .....	IDLE CUT- OFF
THROTTLE.....	CLOSED
ALTERNATE STATIC AIR VALVE .....	CHECKED, then OFF
AVIONICS MASTER.....	OFF
ALL PANEL ELECTRICAL SWITCHES.....	OFF
MASTER SWITCH .....	OFF
MAGNETOS / IGNITION SWITCH .....	OFF
CIRCUIT BREAKERS.....	CHECKED
MASTER SWITCH .....	ON
BATTERY VOLTAGE .....	CHECKED
EXTERIOR LIGHTS / PITOT HEAT .....	CHECKED, then OFF
INTERIOR LIGHTS .....	(as required) CHECKED
FLAPS .....	EXTEND
ELT SWITCH / LIGHT .....	OFF
ANNUNCIATOR PANEL / LIGHTS.....	TESTED
MASTER SWITCH .....	OFF
WINDSHIELD .....	(if needed) CLEANED

**COCKPIT AND CABIN, EXPANDED**

▶ **AIRCRAFT ACCEPTANCE.....COMPLETE**

**AIRCRAFT ACCEPTANCE (SOP)**

- ✓ Ensure that the aircraft contains all the necessary paperwork and keys, and that the previous Hobbs / Tach times have been filled out
- ✓ Check that no groundable squawks exist
- ✓ Approaching the aircraft, check that there is no obvious damage
- ✓ It may be advisable to check the fuel quantity and oil level immediately upon arrival to the aircraft, as time could be saved by placing a fuel request right away rather than later in the preflight, and by obtaining oil while inside the building for other tasks
- ✓ If there are any discrepancies, damage or extremely low fuel / oil levels (below required BSU safety minimums), report to Dispatch immediately

**MAINTENANCE STATUS .....VERIFIED / CLEARED**

**MAINTENANCE STATUS CHECK (SOP)**

Maintenance status check contains, but is not limited to, the following:

- ✓ Check the Annual Inspection date
- ✓ Check the 100 hr and the 50 hr tachometer times
- ✓ Check all avionics, Mode C transponder, altimeter, pitot-static and ELT inspection dates and times
- ✓ Check any applicable Airworthiness Directives
- ✓ **Verify any inspection times, dates and limits have not been / will not be exceeded during the planned flight**
- ✓ Check that the GPS database card is present (check inside the can if not installed in the GPS unit).
- ✓ Verify VOR check is current
- ✓ Verify all necessary documents are properly completed and present in the aircraft can.
- ✓ If there are any doubts about aircraft airworthiness status, contact Dispatch immediately.



**HOBBS / TACH METERS..... RECORDED**

Record the current Hobbs reading and verify it matches the value on the Aircraft Data Sheet.  
Record the current Tachometer time and verify it matches the value on the Aircraft Data Sheet.  
Notify Dispatch of any discrepancy.

**POH / AIRCRAFT DOCUMENTS .....AVAILABLE / CHECKED**

Check the Airworthiness Certificate, Aircraft Registration, and FCC Radio Station Permit (international flights only). Verify that the correct and complete Pilot’s Operating Handbook or Aircraft Flight Manual, Weight and Balance information, and additional appropriate operations manuals (e.g. Garmin G430 GPS manual) are aboard. Verify flight crew possesses appropriate photo identification, current pilot and medical certificates, and all other appropriate required documents.

**PARKING BRAKE .....ON**

Set the parking brake to ON to prevent inadvertent aircraft movement and to check parking brake operation.

**CONTROL LOCK ..... REMOVED**

Remove control lock from the yoke column. Secure in cockpit side pocket near pilot’s left leg.

**FLIGHT CONTROLS ..... FREE / CORRECT**

Verify full freedom of travel and correct movement/displacement of all flight controls.

**FIRE EXTINGUISHER ..... GREEN ARC / SECURED**

Check that the fire extinguisher gauge is in the green arc indicating ready for use. Check that the fire extinguisher is secure and will not move inadvertently.

**FUEL SELECTOR (feel for detent)..... EXERCISE, then BOTH**

Verify that the fuel selector can be moved freely between LEFT, RIGHT and BOTH positions. Then, set the fuel selector to BOTH. Feel that fuel selector has engaged the detent when in BOTH position.

**TRIM WHEEL ..... EXERCISE, then TAKEOFF**

Verify that trim wheel moves freely, then set the trim wheel to TAKEOFF, so that the trim tab position on the elevator can be verified as correct during the exterior preflight. Verify visually.

**CARBON MONOXIDE DETECTOR ..... CHECK DATE**

Check that the carbon monoxide detector is present and has not expired.

**MIXTURE ..... IDLE CUT- OFF**

Verify that the mixture control is in full IDLE CUT-OFF position (all the way back).

**THROTTLE ..... CLOSED**

Verify that the throttle control is in IDLE position (all the way back).

**ALTERNATE STATIC AIR VALVE .....CHECKED, then OFF**

Pull the red ALTERNATE AIR STATIC valve knob to activate alternate air source. Check the static instrument indications to confirm operation. Push the valve full in to turn it OFF.

**AVIONICS MASTER .....OFF**

Verify that avionics master switch is OFF, to prevent damage to avionics later when the master switch is cycled.

**ALL PANEL ELECTRICAL SWITCHES ..... OFF**

Verify that all electrical switches on the panel under the yoke are OFF.

**MASTER SWITCH ..... OFF**

Verify that both sides of the red electrical system MASTER SWITCH are in the OFF position.

**MAGNETOS / IGNITION SWITCH ..... OFF**

Verify that the combination MAGNETOS / IGNITION SWITCH is in the OFF position. Do not insert the key.

**CIRCUIT BREAKERS ..... CHECKED**

Verify all circuit breakers are checked, are in, and that any circuit breakers that are disengaged are properly placarded and collared. **IF A CIRCUIT BREAKER IS DETECTED THAT IS OUT, and appropriate maintenance placard is not present, INFORM DISPATCH. The airplane is not to be flown until appropriate action is taken and the airplane is cleared for return to service by Maintenance.** See Chapter 2, Circuit Breaker Policy section, for additional guidance.

**MASTER SWITCH ..... ON**

Turn both sides of the red electrical system MASTER SWITCH (ALT and BAT) to ON, in order to check electrically operated systems.

**BATTERY VOLTAGE (not below 20 V) ..... CHECKED**

Battery voltage is indicated on the combined DIGITAL CLOCK/OAT/VOLT INDICATOR (for example, 24.0E, implying 24 Volts). Press the OAT/VOLT button if temperature is indicated instead of voltage, to change back to voltage readout. Read the battery voltage and ensure it shows no less than 20 Volts immediately after Master Switch activation. A fully charged battery will show  $\approx$  24 Volts. If upon arrival to the airplane, the voltage is below 20 Volts with no electrical accessories operating and with the lights OFF, PUI shall inform PIC and/or Dispatch, who will then make a determination to contact Maintenance.

**CAUTION**

*Ensure that the Avionics Master switch is OFF before turning the battery master switch ON or OFF. This will prevent any inadvertent electrical charge from damaging the avionics equipment when the electrical system is engaged.*

**FUEL GAUGES ..... CHECKED / ADEQUATE**

Check fuel gauges to confirm that they are operational.

**WARNING**

**Flight crews shall not rely on fuel gauges alone and shall also manually check fuel levels in each tank prior to each flight.**

**ANNUNCIATOR PANEL / LIGHTS.....TESTED / ILLUMINATED**

TEST the annunciator panel lights by moving the switch to the TEST position. All annunciator lights should light up, indicating they are not burned out. Return it to BRT or DIM position, as appropriate. Check that the appropriate annunciator lights remain illuminated (due to the engine not running), and that the other lights become extinguished.

**LIGHTS and PITOT HEAT .....CHECKED OUTSIDE, then OFF**

Check ALL exterior and the necessary interior lights for proper operation. TURN THE LIGHTS OFF IMMEDIATELY after the required checks are completed before continuing with the rest of the preflight. Failure to do so may result in a good battery being drained to a point where engine start may be difficult or impossible. Turn the pitot heat ON, and, WITHOUT DELAY, verify pitot tube is heating properly. Turn pitot heat switch OFF immediately after.

**CAUTION**

*The pitot mast achieves operating temperature quickly and can cause injury. Do NOT operate pitot heat on the ground for more than 30 seconds. Test pitot heat temperature immediately after turning pitot heat switch ON, then return to the cockpit and turn pitot heat OFF.*

**FLAPS..... EXTEND**

In increments, fully extend flaps while listening for binding noises and checking for correct operation, indicated by flaps deploying smoothly, evenly, and correct number of degrees.

**ELT SWITCH / LIGHT .....OFF**

Verify that the remote ELT switch in the cockpit is set to ARMED but that ELT is not transmitting, and the red light is OFF. If the ELT is transmitting, attempt to turn it off via the ELT switch. Report the activation to Dispatch immediately.

**MASTER SWITCH .....OFF**

Upon conclusion of the preflight checks of electrically operated systems, turn both sides of the MASTER SWITCH OFF to prevent the battery from being drained more than necessary.

**WINDSHIELD / WINDOWS.....(if needed) CLEANED**

Clean windows and windscreen as necessary with approved cleaning solution and cloth. DO NOT USE UNAPPROVED CLEANERS, OR ANY CLEANERS CONTAINING ALCOHOL OR AMMONIA. If approved aviation windshield cleaner is not available, a solution of water and regular hand or dish soap can be substituted.

**LEFT WING**

LEFT MAIN GEAR / TIRE / BRAKE .....	CHECKED
FLAP / AILERON / STATIC WICKS (2) .....	CHECKED
WING TIP / LIGHTS.....	CHECKED
LEADING EDGE .....	CHECKED
TIE DOWN.....	REMOVED
WING INSPECTION PLATES .....	CHECKED
FUEL VENT .....	CHECKED
STALL WARNING HORN OPENING.....	CHECKED
PITOT TUBE.....	CHECKED
FUEL DRAINS (5).....	DRAINED / CHECKED
FUEL QUANTITY / FUEL CAP .....	CHECKED / SECURE

**LEFT WING. EXPANDED**

**LEFT MAIN GEAR / TIRE / BRAKE ..... CHECKED**  
 Inspect the main gear components in accordance with the following SOP.

**MAIN GEAR INSPECTION (SOP)**

Gear strut.....	SECURE / NO DAMAGE
Strut housing.....	FREE OF CRACKS
Hub assembly.....	SECURE
All connections.....	SECURE
Brake lines and brake caliper assembly.....	NO LEAKS / SECURE
Brake disk.....	NO DAMAGE OR CRACKS
Brake pads wear .....	( <b>minimum 1/8"</b> remaining) ACCEPTABLE
Tire inner sidewall .....	NO DAMAGE
Tire tread wear.....	ACCEPTABLE
Tire outer sidewall.....	NO DAMAGE
Air valve cover .....	SECURE

<b>WARNING</b>
<p><b>Flight crews shall ground the aircraft if any of the following conditions are present during inspection of the landing gear tires:</b></p> <ul style="list-style-type: none"> <li>• <b>Tire displays areas of exposed cord or belts</b></li> <li>• <b>Tire clearly displays visible grooves in the center section of the tire</b></li> <li>• <b>Tire displays cuts or gouges of undeterminable depth, or displays cuts/gouges that enter the tire cord structure</b></li> </ul>

**FLAP / AILERON / STATIC WICKS (2) ..... CHECKED**

Check flap, aileron and all hinge points for connections and free movement, verify all are secure and undamaged (e.g. dents, binding). Ensure the three (3) counterweights on the aileron are present and secure. Inspect the flap for damage and excessive play. Check the compression nuts on the aileron and flap activation rods for looseness. Check if the static wicks are missing or damaged.

**WARNING**

**Whenever checking the aileron connections from the underside of the wing, ALWAYS support the aileron firmly with one hand before inserting your fingers into the opening between the aileron and the wing.**

**Failure to do so will allow the aileron to move, catching fingers between the aileron and the wing's trailing lower edge. These edges are relatively sharp, and due either to a wind gust or inadvertent movement of the controls by another crewmember, serious injury to the hand / fingers could result.**

**WING TIP / LIGHTS ..... CHECKED**

Check exterior condition of the wing tip and the wing tip lights. Look for unrepaired cracks and other physical damage.

**LEADING EDGE / LIGHTS ..... CHECKED**

Check the leading edge for dents and other damage. Check the LANDING and TAXI light assembly for physical damage.

**TIE DOWN.....REMOVED**

Remove and securely store the tie down inside the aircraft.

**WING INSPECTION PLATES ..... SECURE**

Verify that all wing inspection plates on the underside of the wing are securely in place, and inspect for any missing screws.

**FUEL VENT.....UNOBSTRUCTED**

Check that the fuel vent protruding from the bottom of the wing is unobstructed. Fuel dripping from the vent indicates fuel overflow.

**STALL WARNING HORN OPENING.....CLEAR**

Check that the stall warning horn opening on the leading edge is clear.

**PITOT TUBE ..... CHECKED**

Check that the pitot tube front opening and drain hole in the rear bottom are clear. Gently touch the pitot tube to ensure that it is secure. Ensure that the conical shaped front opening part of the pitot tube is not loose, by gently trying to rotate it, whereas it should not move.

**FUEL DRAINS (5) .....DRAINED / CHECKED**

Drain the total of five (5) fuel drains on the left underside of the wing. Ensure you draw a large fuel sample from each drain ( $\approx 1/5$  of the jar) to fill the fuel sampling jar (GATS jar). Check the fuel for water, contaminants and correct fuel grade by examining the color. When checking the fuel cap in the following steps, drain clean fuel back into the fuel tank through the mesh screen of the GATS jar.

**FUEL QUANTITY / FUEL CAP ..... CHECKED / SECURE**

Visually check fuel quantity and color by removing the fuel cap and examining the fuel inside the fuel tank. Use the fuel measuring dipstick to determine exact fuel level. Drain the clean fuel from the sample jar back into the tank, as specified earlier. Examine the fuel vent built into the fuel cap. Check the condition of the rubber gasket. Close the fuel cap securely. Do not leave an open fuel cap unattended.

**NOSE**

STATIC PORT .....	UNOBSTRUCTED
COWLING / AUX. POWER DOOR .....	SECURE
NOSE GEAR .....	CHECKED
BREATHER VENTS .....	UNOBSTRUCTED
PROPELLER AND SPINNER.....	CHECKED
COOLING AIR INLETS.....	CLEAR
ALTERNATOR BELT.....	SECURE
AIR FILTER INTAKE .....	CHECKED
OIL LEVEL / DIPSTICK / DOOR .....	CHECKED / SECURE
FUEL DRAINS (3) .....	DRAINED / CHECKED

**NOSE, EXPANDED**

**STATIC PORT.....CLEAR**

Check that the static port is clean and unobstructed.

**COWLING / AUX. POWER DOOR ..... SECURE**

Check that cowling is secure, as indicated by the cowling screws (Dzus fasteners) being flush against the cowling without protruding significantly. Check that the auxiliary power door is closed and secure.

**NOSE GEAR ..... CHECKED**

Inspect the main gear components in turn in accordance with the SOP.

**NOSE GEAR INSPECTION (SOP)**

Oleo strut extension.....	VERIFY ≈ 2 ½ inch
Strut housing.....	FREE OF CRACKS
Components (steering links, shimmy damper).....	SECURE
All connections (bolts, nuts, cotter pins).....	SECURE
Hub assembly.....	SECURE
Tire tread wear.....	ACCEPTABLE
Air valve cover .....	SECURE

**WARNING**

**Flight crews shall ground the aircraft if any of the following conditions are present during inspection of the landing gear tires:**

- **Tire displays areas of exposed cord or belts**
- **Tire clearly displays visible grooves in the center section of the tire**
- **Tire displays cuts or gouges of undeterminable depth, or displays cuts/gouges that enter the tire cord structure**

**BREATHER VENTS ..... UNOBSTRUCTED**

Check that the vents protruding from the underside of the nose, by the nose gear, are free from obstructions (debris, ice, snow, etc.).

**PROPELLER AND SPINNER ..... CHECKED**

Systematically run your hand over the propeller blades to check the propeller face, edges and back for damage. Propeller should be free of nicks, cracks, or spurs. Verify that spinner has no damage and is secure. Any propeller nick that is enough to catch on finger moved along the blade should be evaluated by Maintenance before flight.

**COOLING AIR INLETS ..... CLEAR**

Check the front cowl openings, which comprise the cooling air inlets, for contamination, foreign objects, obstructions and damage. Check the baffle plates and engine cylinder cooling fins inside for the same.

**ALTERNATOR BELT ..... SECURE**

Check that the alternator belt inside the front cowling is secure by gently tugging on it and ensuring it feels appropriately tight. Inspect the visible portion of the alternator belt for damage.

**AIR FILTER INTAKE ..... CHECKED**

Inspect the air filter intake of the fuel injection system for contamination and foreign objects.

**OIL LEVEL / DIPSTICK / DOOR ..... CHECKED / SECURE**

Open the oil door and check inside for any obvious damage / abnormalities, within the limitations of the small oil door opening. Remove the oil dipstick and check the oil level (**6 quarts minimum**). Secure the oil dipstick. Close the oil door and check that it latches securely. Never leave the oil dipstick /oil door removed/unsecure and unattended.

**FUEL DRAINS (3) ..... DRAINED / CHECKED**

Drain the total of three (3) fuel drains on the underside of the nose. Drain the fuel selector drain, the fuel reservoir tank drain and the fuel strainer drain, the last being the closest to the front of the aircraft. Draw a good sample,  $\approx 1/3$  of the GATS jar from each drain to fill the jar. Check the fuel for water, contaminants and correct fuel grade. Drain clean fuel back into the fuel tank through the mesh screen of the GATS jar.

**RIGHT WING**

FUEL DRAINS (5) .....	DRAINED / CHECKED
FUEL QUANTITY / FUEL CAP .....	CHECKED / SECURE
RIGHT MAIN GEAR / TIRE / BRAKE .....	CHECKED
LEADING EDGE.....	CHECKED
TIE DOWN.....	REMOVED
WING INSPECTION PLATES .....	SECURE
WING TIP / LIGHTS .....	CHECKED
AILERON / STATIC WICKS (2) / FLAP .....	CHECKED

**RIGHT WING, EXPANDED**

**FUEL DRAINS (5) ..... DRAINED / CHECKED**

Drain the total of five (5) fuel drains on the left underside of the wing. Ensure you draw a large fuel sample from each drain ( $\approx 1/5$  of the jar) to fill the fuel sampling jar (GATS jar). Check the fuel for water, contaminants and correct fuel grade by examining the color. When checking the fuel cap in the following steps, drain clean fuel back into the fuel tank through the mesh screen of the GATS jar.

**FUEL QUANTITY / FUEL CAP ..... CHECKED / SECURE**

Visually check fuel quantity and color by removing the fuel cap and examining the fuel inside the fuel tank. Use the fuel measuring dipstick to determine exact fuel level. Drain the clean fuel from the sample jar back into the tank, as specified earlier. Examine the fuel vent built into the fuel cap. Check the condition of the rubber gasket. Close the fuel cap securely. Do not leave an open fuel cap unattended.

**RIGHT MAIN GEAR / TIRE / BRAKE ..... CHECKED**

Inspect the main gear components in accordance with the following SOP.

**MAIN GEAR INSPECTION (SOP)**

Gear strut.....	SECURE / NO DAMAGE
Strut housing.....	FREE OF CRACKS
Hub assembly.....	SECURE
All connections .....	SECURE
Brake lines and brake caliper assembly.....	NO LEAKS / SECURE
Brake disk.....	NO DAMAGE OR CRACKS
Brake pads wear.....	(minimum 1/8" remaining) ACCEPTABLE
Tire inner sidewall.....	NO DAMAGE
Tire tread wear.....	ACCEPTABLE
Tire outer sidewall .....	NO DAMAGE
Air valve cover .....	SECURE

<b>WARNING</b>
<p><b>Flight crews shall ground the aircraft if any of the following conditions are present during inspection of the landing gear tires:</b></p> <ul style="list-style-type: none"> <li>• <b>Tire displays areas of exposed cord or belts</b></li> <li>• <b>Tire clearly displays visible grooves in the center section of the tire</b></li> <li>• <b>Tire displays cuts or gouges of undeterminable depth, or displays cuts/gouges that enter the tire cord structure</b></li> </ul>

**LEADING EDGE..... CHECKED**  
 Check the leading edge for dents and other damage.

**TIE DOWN..... REMOVED**  
 Remove and securely store the tie down inside the aircraft.

**WING INSPECTION PLATES ..... SECURE**  
 Verify that all wing inspection plates on the underside of the wing are securely in place, and inspect for any missing screws.

**WING TIP / LIGHTS ..... CHECKED**  
 Check exterior condition of the wing tip and the wing tip lights. Look for unrepaired cracks and other physical damage.

**AILERON / STATIC WICKS (2) / FLAP ..... CHECKED**  
 Check aileron, flap and all hinge points for connections and free movement, verify all are secure and undamaged (e.g. dents, binding). Ensure the three (3) counterweights on the aileron are present and secure. Inspect the flap for damage and excessive play. Check the compression nuts on the aileron and flap activation rods for looseness. Check if the static wicks are missing or damaged.

<b>WARNING</b>
<p><b>Whenever checking the aileron connections, from the underside of the wing, ALWAYS support the aileron firmly with one hand before inserting your fingers into the opening between the aileron and the wing.</b></p> <p><b>Failure to do so will allow the aileron to move, catching fingers between the aileron and the wing’s trailing lower edge. These edges are relatively sharp, and due either to a wind gust or inadvertent movement of the controls by another crewmember, serious injury to the hand / fingers could result.</b></p>

**FUSELAGE and EMPENNAGE**

FUSELAGE / ANTENNAS .....	CHECKED
HORIZONTAL STABILIZER (RIGHT).....	CHECKED
ELEVATOR (RIGHT) and TRIM TAB .....	CHECKED
ELEVATOR+RUDDER CABLES/PINS/NUTS/STOPS.....	SECURE
TAIL TIE DOWN .....	REMOVED
VERTICAL STABILIZER and ANTENNAS .....	CHECKED
RUDDER and STATIC WICKS .....	CHECKED
ELEVATOR (LEFT) .....	CHECKED
HORIZONTAL STABILIZER (LEFT).....	CHECKED
BAGGAGE DOOR.....	SECURE

**360° WALK AROUND..... COMPLETE**

**FUSELAGE and EMPENNAGE, EXPANDED**

**FUESELAGE / ANTENNAS..... CHECKED**  
 Check the right side of the fuselage for damage. Check that all external antennas on top of the fuselage are secure and free of damage.

**HORIZONTAL STABILIZER (RIGHT)..... CHECKED**  
 Check the leading edge, the top and the bottom of the horizontal stabilizer right side for damage.

**ELEVATOR (RIGHT) and TRIM TAB .....** **CHECKED**  
 Check the elevator right side. Examine for damage, looseness, freedom of movement, surface condition, hinges, attachment points and all visible connections. Check that the trim tab is in neutral position, in agreement with the pitch trim wheel setting in the cockpit. Lift up the elevator and check the underside, including the trim tab connections. Ensure both trim tab castle nuts and safety pins (cotter pins) are secure. Check if the static wicks are missing or damaged.

**ELEVATOR+RUDDER CABLES/PINS/NUTS/STOPS..... SECURE**  
 Continue inspecting the underside. Systematically look at rudder cables, safety wires, castle nuts, safety pins and rudder stops. Examine elevator cables, safety wires, castle nuts, safety pins and elevator stops. Perform this step for both the **RIGHT** and the **LEFT** underside of the airplane.

**TAIL TIE DOWN..... REMOVED**  
 Remove and securely store the tail tie-down inside the airplane.

**RUDDER, RUDDER TRIM and STATIC WICKS .....** **CHECKED**  
 Check the rudder and the rudder trim tab. **DO NOT MOVE THE RUDDER BY THE TRIM TAB.** It is set by maintenance and cannot be changed by the pilot. **DO NOT ATTEMPT TO STRAIGHTEN.** Properly set rudder trim tab will normally appear bent. Examine the rudder for damage, looseness, freedom of movement, surface condition, hinges, attachment points and all visible connections. Check if the static wicks are missing or damaged.

**VERTICAL STABILIZER and ANTENNAS .....** **CHECKED**  
 Check the vertical stabilizer and antennas for damage.

**ELEVATOR (left) and STATIC WICKS ..... CHECKED**

Check the elevator left side. Examine for damage, looseness, freedom of movement, surface condition, hinges, attachment points and all visible connections. Lift up the elevator and check the underside. Check if the static wicks are missing or damaged.

**HORIZONTAL STABILIZER (left)..... CHECKED**

Check the leading edge, the top and the bottom of the horizontal stabilizer left side for damage.

**BAGGAGE DOOR..... SECURE**

Ensure that the baggage door is securely latched. If any cargo is carried, it must also be locked. Never leave an unsecured baggage door unattended.

**360° WALK AROUND ..... COMPLETED**

Conduct a complete walk-around just prior to entering the airplane. Pay particular attention to any potentially missed items, such as tie-downs, wheel chocks, unlatched oil/baggage doors, fuel caps or unsecured/foreign objects on the aircraft surfaces and on the ground nearby.

**IF AIRCRAFT IS TO BE LEFT UNATTENDED**

**TIE DOWN(s) / WHEEL CHOCKS..... INSTALLED**

**FUEL CAPS / OIL DIPSTICK / DOORS..... SECURE**

**- AFTER RETURNING TO THE AIRCRAFT -**

**TIE DOWN(s) / WHEEL CHOCKS..... REMOVED**

**360° WALK AROUND ..... COMPLETE**

**IF AIRCRAFT IS TO BE LEFT UNATTENDED, EXPANDED**

**TIE DOWN(s) or WHEEL CHOCKS..... INSTALLED**

Secure the plane against movement by installing, at minimum, the tail tie down and/or wheel chocks. Use the parking brake if no tie down location or wheel chocks are available.

**FUEL CAPS / OIL DIPSTICK / DOORS ..... SECURE**

Ensure that all fuel caps, oil dipstick, oil door and aircraft doors are secure.

**- AFTER RETURNING TO THE AIRCRAFT -**

**TIE DOWN(s) / WHEEL CHOCKS ..... REMOVED**

Remove all tie downs and wheel chocks, and store securely.

**360° WALK AROUND ..... COMPLETE**

Perform a complete walkaround of the aircraft, checking for potentially missed items, such as tie downs, fuel caps, oil dipstick and door, baggage door, etc. Also, check for foreign objects on the surfaces of the aircraft, as well as on the ground next to the aircraft.

***NORMAL PROCEDURES***

**BEFORE START**

PARKING BRAKE ..... SET  
 PASSENGER BRIEF ..... COMPLETE  
 SEATBELTS / SHOULDER HARNESSSES ..... ON / CHECKED  
 FUEL SELECTOR ..... (feel for detent) BOTH  
 MIXTURE ..... IDLE CUT-OFF  
 THROTTLE ..... OPEN 1/4 INCH  
 LIGHTS ..... (as required) ON

**BEFORE START, EXPANDED**

**PARKING BRAKE ..... SET**  
 Verify that Parking Brake is ON to assist in preventing aircraft from moving during start.

**CAUTION**

*The parking brake alone should not be relied on to prevent aircraft movement, and should only be used as a secondary backup. Always **apply** and **hold** main brakes during engine start, and anytime the aircraft is stationary with engine running.*

**PASSENGER BRIEF (SOP) ..... COMPLETED**

**Passenger Brief SOP**

Passenger brief must be oriented toward passengers who may not have any previous aviation experience. Perform a standard brief tailoring it appropriately to the flight:

1. Brief the passengers as required by 14 CFR FAR 91.107 on the following:
  - Seatbelts and shoulder harnesses
    1. HOW to use
    2. WHEN to use
2. In the brief, include the following, as appropriate:
  - EMERGENCY EXITS location and operation
  - Instructions to be followed in case of EMERGENCY
  - Emergency equipment (e.g. fire extinguisher) location and operation
  - Survival equipment / first aid kit location and use
  - TRAFFIC AVOIDANCE - how to assist the pilot with traffic
  - Cabin vents operation
  - Any other pertinent information for the flight

**SEATBELTS / SHOULDER HARNESSSES ..... ON / CHECKED**

Verify that both the flight crew and the passengers have their seatbelts and shoulder harnesses fastened securely, as required by FAR 91.107

**FUEL SELECTOR (feel for detent)..... ON**  
Verify that the fuel selector is in the BOTH position and securely engaged in the detent.

**MIXTURE..... IDLE CUT-OFF**  
Verify that the mixture is in the IDLE CUT-OFF (full back) position.

**THROTTLE..... OPEN 1/4 INCH**  
Verify that the throttle is open  $\approx$  1/4 INCH to allow for sufficient fuel/air for both engine prime and engine start. Guard against opening the throttle excessively. Only a small fraction of throttle movement is required.

**LIGHTS.....(as required) ON**  
Turn ON appropriate lights to warn others about impending engine start and to comply with appropriate regulations regarding lights during ground and flight operations.

**DAYTIME:** Turn ON the BEACON light, and, if appropriate, the STROBE lights, and leave them on for anti-collision purposes for the entire flight, as required by FAR 91.209(b). One permitted exception is strobe lights should be turned off on the ground when they adversely affect ground personnel or other pilots.

**NIGHTTIME:** In addition to the BEACON light, turn on the NAV lights and leave them on if any portion of the flight can potentially occur during the period between sunset and sunrise, as required by FAR 91.209(a). If appropriate, you may momentarily turn on the STROBES and/or TAXI light to warn others about the impending engine start and to clear the area, but then turn these lights OFF to avoid blinding others on the ramp.

**NOTE**

Even if departing prior to sunset on a flight that may potentially extend beyond it, it is advisable to turn the NAV LIGHTS ON immediately, to avoid forgetting to do it later in the flight when the sunset occurs.

**ENGINE START**

MASTER SWITCH ..... ON  
 ENGINE PRIME (SOP)..... (if and as required) COMPLETE  
 ENGINE START (SOP) ..... COMPLETE  
 OIL PRESSURE / TEMPERATURE ..... CHECKED  
 AMMETER / VOLTAGE ..... CHECKED / NORMAL  
 AVIONICS SWITCH .....ON  
 ► COCKPIT COMMUNICATIONS CHECK..... COMPLETE  
 MIXTURE ..... (as required) LEANED FOR TAXI  
 FLAPS ..... UP

**ENGINE START, EXPANDED**

**MASTER SWITCH** ..... **ON**  
 Turn ON the master switch to provide electrical power for the engine, prime, start and the lights.

**ENGINE PRIME (SOP)**.....**(as required) COMPLETED**  
 This step may be skipped if the aircraft has flown in the previous 30 min. In those situations, attempt to start the engine without priming first, and only prime if the start attempt fails. Refer to the POH/AFM for very specific guidelines on engine priming and starting.

**CAUTION**

*Avoid over-priming the engine. Do not allow the fuel pump to continue running with mixture in full rich position after fuel flow indication has stabilized (3-5 seconds).*

*Consult POH / AFM, Section 4, Normal Procedures:*

*Checklist Procedures - Starting Engine  
 Amplified Procedures – Starting Engine*

**ENGINE PRIME SOP**

MIXTURE ..... IDLE CUT-OFF  
 THROTTLE ..... OPEN 1/4 INCH  
 FUEL PUMP ..... ON  
 MIXTURE ..... FULL RICH  
 FUEL FLOW..... (3 to 5 seconds) OBSERVED AND STABILIZED  
 MIXTURE ..... IDLE CUT-OFF  
 FUEL PUMP ..... OFF

**ENGINE PRIME SOP, EXPANDED**

**MIXTURE..... IDLE CUT-OFF**  
Verify the mixture is in the IDLE CUT-OFF position in preparation for the prime.

**THROTTLE ..... OPEN 1/4 INCH**  
Verify that the throttle is open ¼ inch to allow the fuel to enter the engine during later steps. Skipping or missing this step will result in inadequate prime.

**FUEL PUMP ..... ON**  
Turn the auxiliary fuel pump ON to allow for priming the engine with fuel.

**MIXTURE..... FULL RICH**  
Move the mixture to FULL RICH position to allow the fuel to enter the engine.

**FUEL FLOW.....(3 to 5 seconds) OBSERVED AND STABILIZED**  
Look for fuel flow indications on the engine’s fuel flow gauge. If the fuel flow is not observed, it may be due to the throttle being in closed position instead of being open ¼ inch. If this occurs, shut off the fuel pump, recheck the throttle and restart the Engine Prime SOP from the beginning.

**MIXTURE..... IDLE CUT-OFF**  
Move the mixture to IDLE CUT-OFF position immediately after the fuel flow indications are observed, to avoid flooding the engine with excess fuel.

**FUEL PUMP .....OFF**  
Turn the auxiliary fuel pump OFF once the priming sequence has been complete.

**ENGINE START (SOP)..... COMPLETED**

**ENGINE START SOP**

**NORMAL START**  
Engine prime is complete or not required.  
Engine is NOT flooded.  
Engine is warm or cold.

**MIXTURE..... IDLE CUT-OFF**  
**THROTTLE ..... OPEN 1/4 INCH**  
**PROPELLER AREA.....CLEAR**  
**STARTER.....(10 seconds maximum) ENGAGE**  
**MIXTURE ..... ADVANCE AS ENGINE STARTS TO FULL RICH**  
**THROTTLE ..... 1000 RPM**

**NORMAL START, EXPANDED**

**MIXTURE ..... IDLE CUT-OFF**  
Verify MIXTURE is in IDLE CUT-OFF position in preparation for engine start.

**THROTTLE ..... OPEN 1/2 INCH**  
Verify that the throttle is open ¼ inch for engine start.

**PROPELLER AREA ..... CLEAR**  
Clear the propeller area. Both **VISUALLY** scan the area and **AUDIABLY** announce with a **LOUD VOICE** through the open window to “**CLEAR PROP!!!**”.

**STARTER..... (10 seconds maximum) ENGAGE**  
Engage the starter with the key in the ignition switch. If the engine starts, proceed to the next step. If the engine does not start within **10 seconds** of cranking, allow the starter to cool for **20 seconds** before cranking the engine again. Attempt this engine cranking sequence a maximum total of **three times**. If the engine still does not start, allow the starter to cool for **10 minutes**. Repeat the starting sequence complying with the above limitations. If after the additional 3 cranking attempts of up to 10 seconds, with 20 second breaks in between, the engine still does not start, inform Dispatch / Maintenance.

**NOTE**

In cold weather, a cold engine may not start at all. If this is the suspected cause of the problem, additional priming may be required in accordance with Engine Prime SOP.

**MIXTURE .....ADVANCE AS ENGINE STARTS**  
As the engine starts, advance mixture to FULL RICH smoothly to provide the engine with continuous fuel flow. The engine may have sufficient fuel for the engine start from priming, but will quickly run out of fuel and stop if this step is not timely accomplished.

**THROTTLE ..... 1000 RPM**  
Set the throttle to 1000 RPM to avoid either excessively high or low engine idling.

**.FLOODED START**  
**Engine is flooded with excess fuel, typically from over-priming.**

**FUEL PUMP .....OFF**  
**MIXTURE..... IDLE CUT-OFF**  
**THROTTLE ..... FULL FORWARD**  
**PROPELLER AREA.....CLEAR**  
**STARTER.....(10 seconds maximum) ENGAGE**  
**MIXTURE ..... ADVANCE AS ENGINE STARTS TO FULL RICH**  
**THROTTLE ..... CLOSE PROMPTLY, then 1000 RPM**

**FLOODED START , EXPANDED**

**FUEL PUMP .....OFF**  
 Verify the auxiliary fuel pump is OFF to avoid adding excess fuel to the already flooded engine.

**MIXTURE..... IDLE CUT-OFF**  
 Verify MIXTURE is in IDLE CUT-OFF position in preparation for engine start and to prevent additional fuel from reaching flooded engine immediately after start.

**THROTTLE ..... FULL FORWARD**  
 Verify that the throttle is fully open (FULL FORWARD) for flooded engine start, to allow maximum amount of air to enter the engine to mix with the fuel already there.

**PROPELLER AREA.....CLEAR**  
 Clear the propeller area. Both **VISUALLY** scan the area and **AUDIABLY** announce with a **LOUD VOICE** through the open window to “**CLEAR PROP!!!**”.

**STARTER.....(10 seconds maximum) ENGAGE**  
 Engage the starter with the key in the ignition switch. If the engine starts, proceed to the next step. If the engine does not start within **10 seconds** of cranking, allow the starter to cool for **20 seconds** before cranking the engine again. Attempt this engine cranking sequence a maximum total of **three times**. If the engine still does not start, allow the starter to cool for **10 minutes**. Repeat the starting sequence complying with the above limitations. If after the additional 3 cranking attempts of up to 10 seconds, with 20 second breaks in between, the engine still does not start, inform Dispatch / Maintenance.

**MIXTURE..... ADVANCE AS ENGINE STARTS**  
 As the engine starts, advance mixture to FULL RICH smoothly to provide the engine with continuous fuel flow. The engine will quickly run out of fuel and stop if this step is not timely accomplished.

**THROTTLE .....CLOSE PROMPTLY, then 1000 RPM**  
As the engine starts, RETARD the throttle promptly to prevent excessively high RPM that could result from the flooded start procedure. Once the engine is running smoothly, set the throttle to 1000 RPM to avoid either excessively high or low engine idling.

**OIL PRESSURE..... CHECKED**  
Check that oil pressure comes up into the green arc within **30 seconds** (in extremely cold weather, it may take up to **1 minute**). If the oil pressure does not show an indication within the specified window, shut down the engine and inform Dispatch / Maintenance.

**AMMETER / VOLTAGE ..... CHECKED**  
With the throttle set to 1000 RPM, check that the AMMETER indicates the battery is being charged (needle to the plus side). Check that the VOLTAGE on the digital readout indicates  $\approx 28$  Volts. (Refer to Preflight Checklist>Cabin Check>Battery Voltage Check for information on how to read the meter, or consult the AFM / POH).

**NOTE**

An abnormally high rate of charge indication on the ammeter for no apparent reason ( $\approx 30$  AMP or more) immediately following engine start may indicate that starter did not disengage and is “hung” (still running in conjunction with the engine).

If a depleted battery and electrical accessories do not account for the high rate of charge, and a hung starter is suspected, shutdown the engine and inform Dispatch / Maintenance.

**AVIONICS SWITCH .....ON**  
Turn the avionics switch ON to provide power to the communication and navigation equipment. Verify that the intercom is functional by addressing, in turn, each of the other crewmembers and passengers.

► **COCKPIT COMMUNICATIONS CHECK..... COMPLETE**

**Cockpit Communications Check (SOP)**

Pilot 1: “How do you hear me?”

Pilot 2 / Passenger: “Loud and clear, you - me?”

Pilot 1: “Loud and clear.”

....Repeat for other crewmembers and passengers

**MIXTURE .....(as required) LEANED FOR TAXI**

If appropriate, lean the mixture for taxi to prevent fouling of spark plugs from excessively rich mixture during low RPM ground operations in accordance with Mixture Ground Leaning SOP of this chapter.

**FLAPS .....UP / CONFIRMED**

Retract the flaps and observe the ammeter during flap retraction. An initial movement of the needle during flap motor activation would confirm the ammeter is functional. Verify flaps retract smoothly, evenly and fully. CONFIRM by observing both LEFT and RIGHT flaps outside on the wings,

**BEFORE TAXI**

AVIONICS / TRANSPONDER ..... SET / CHECKED  
 FLIGHT INSTRUMENTS / ALTIMETER / HDG ..... SET / CHECKED  
 PARKING BRAKE..... OFF  
 ► TAXI AREA..... CLEAR

**BEFORE TAXI, EXPANDED**

**AVIONICS / TRANSPONDER ..... SET / CHECKED**

Set and check the avionics. Use a left to right, top to bottom flow. Begin with the top radios and continue down until arriving at the transponder. Set the frequencies to be used into the communication and navigation radios. Set the transponder with the appropriate squawk code. Test the transponder by engaging the TEST mode (TST), and then returning it to STANDBY (SBY). Obtain and write down ATIS.

**FLIGHT INSTRUMENTS / ALTIMETER / HDG ..... SET / CHECKED**

Using a left to right, top to bottom flow, set and check flight instruments in accordance with the SOP. Announce the instrument name and the expected indication / setting.

**Flight Instruments Before Taxi Check (SOP)**

- Verify clock is operating properly and set to the correct time.
- Verify magnetic compass case is full of fluid, card is floating freely, and compass deviation card is legible.
- Verify ASI indicates zero.
- Set attitude indicator (AI) for straight and level flight; verify horizon is level
- Set altimeter to the current local altimeter setting and verify within 75' of the local field elevation. If altimeter setting is not available, set to local field elevation.
- Verify the turn coordinator shows wings level and no warning flag
- Check that the slip/skid indicator a.k.a. inclinometer (ball) is centered.
- Check the heading indicator against the magnetic compass and set it as appropriate.
- Note any variations from zero on vertical speed indicator (VSI).
- Set the backup heading indicator (if installed) to the compass heading.

**PARKING BRAKE .....OFF**

Release the parking brake in preparation for moving the aircraft.

- ▶ **TAXI AREA..... CLEAR**  
*Scan the taxi area to make sure it is clear before starting to taxi.*

**TAXI**

**BRAKES ..... CHECKED**  
**INSTRUMENTS TAXI CHECKS (SOP)..... COMPLETED**

**TAXI, EXPANDED**

**Minimizing risk during taxi (SOP)**

PIC is responsible to ensure that the flight crew maintains maximum visual vigilance/collision avoidance during all taxi operations.

Flight crews shall avoid any head-down time until well clear of other parked aircraft, vehicles (e.g. fuel trucks) and other obstructions.

**BRAKES..... CHECKED**

Both PF and PMF must take turns to check the main brakes as soon as the aircraft begins to move. After adding enough power to begin rolling, PF will reduce the power to idle and apply both brakes to evaluate their effectiveness. The PMF will then conduct a similar check immediately after positively exchanging aircraft controls with the PF.

**INSTRUMENTS TAXI CHECKS (SOP)..... COMPLETED**

Using a left to right, top to bottom flow pattern, perform the flight instrument checks that require the aircraft to be moving. Perform these checks when clear of the parking ramp, and away from all obstructions and obstacles.

**INSTRUMENTS TAXI CHECKS (SOP)**

- Magnetic Compass ..... Swings freely during turns, indicates known headings
- Attitude Indicator ..... Erect/stable within 5 min, ≤ 5° of bank during turns
- Turn Coordinator ..... Miniature airplane banks in direction of turns
- Slip/skid Indicator (the ball) ..... Moves freely to the OUTSIDE of turns
- Heading Indicator ..... Turns freely in direction for turns and indicates known headings

**BEFORE TAKEOFF / RUNUP**

- ▶ *MAIN BRAKES (BOTH PILOTS)..... HELD*
- FLIGHT CONTROLS ..... FREE / CORRECT
- TRIM ..... SET FOR TAKEOFF / CHECKED OUTSIDE

- 
- FUEL SELECTOR (feel for detent) ..... BOTH
  - MIXTURE..... FULL RICH
  - THROTTLE ..... **1,800 RPM**
  - MAGNETOS (R, then L) ..... CHECKED (70-125/50) / BOTH
  - OIL TEMPERATURE / PRESSURE ..... CHECKED
  - VACUUM GAUGE / AMMETER..... CHECKED
  - FUEL QUANTITY..... VERIFIED
  - ANNUNCIATOR PANEL..... CLEAR
  - THROTTLE ..... CHECK IDLE
  - MIXTURE..... (as required) LEANED FOR TAXI

- 
- FLIGHT INSTRUMENTS..... DEPARTURE
  - AVIONICS / TRANSPONDER..... DEPARTURE
  - DEPARTURE BRIEF ..... COMPLETE

**BEFORE TAKEOFF / RUN-UP, EXPANDED**

- ▶ *Upon arriving to the Run-up area and coming to a complete stop, verify that the **items on the TAXI checklist have been completed**, as appropriate.*

- ▶ **MAIN BRAKES (BOTH PILOTS)..... HELD**  
*Both pilots must have their feet on the toe brake pedals to ensure the aircraft is secured against forward movement. Even when choosing to engage the parking brake, never rely on the parking brake alone to keep aircraft from moving on the ground.*

**FLIGHT CONTROLS..... FREE / CORRECT**  
 Check that the elevator, ailerons and rudder cockpit controls move all the way to their designed limits freely, smoothly and without binding. At the same time, check that the outside control surface deflections correctly correspond to the cockpit control movements. Pilot conducting the checks should request assistance from the other front-seat occupant to view and verify proper movement of outside control surfaces, as needed.

The following flight control flow checks every possible combination of deflections, as well as full range of movement. It is sometimes referred to as the box pattern or “making the box” because the sequence of flight controls movements approximates tracing four sides of a box.

To assist in quicker determination of correct control deflections, remember:

*The aileron should be UP on the side of the yoke handle that is DOWN (think OPPOSITES). The elevator should be DOWN when yoke is FORWARD, and it should be UP when the yoke is AFT.*

**FLIGHT CONTROLS BEFORE TAKEOFF CHECK (SOP)**

- Yoke full forward and hold ..... Elevator down
  - Yoke full left and hold..... Left aileron up, right aileron down.
  - Yoke full back and hold ..... Ailerons – no change, Elevator up
  - Yoke full right and hold ..... Left aileron down, right aileron up, Elevator up
  - Yoke Full forward and hold ..... Ailerons – no change, Elevator down
- 
- Rudder pedal full left..... Rudder deflects full left
  - Rudder pedal full right..... Rudder deflects full right

**TRIM..... SET FOR TAKEOFF / CHECKED OUTSIDE**  
 Verify that the manual trim wheel is set for TAKEOFF by aligning the mark with the takeoff indicator. Then, VISUALLY confirm OUTSIDE that the trim tab on the elevator is in takeoff position (neutral). This assures that the cockpit trim indicator can be trusted.

**CAUTION**

*Ensure that engine oil temperature has risen into the green arc BEFORE beginning the engine/magneto check portion of the Before Take Off / Engine Run-Up checklist.*

**FUEL SELECTOR (feel for detent).....ON**  
 Verify that the fuel selector is on BOTH. Ensure it is properly engaged in this position by feeling the selector in the detent.

**MIXTURE.....FULL RICH**

Move the mixture to FULL RICH for engine run-up.

**THROTTLE ..... 1,800 RPM**

Set the throttle to 1800 RPM for system checks.

**MAGNETOS (R, then L) ..... CHECKED (80-125/50) / BOTH**

One at a time, check both magnetos. First, switch to the RIGHT magneto by moving the ignition switch two clicks LEFT. Allow 2 seconds to stabilize, then observe the RPM drop AND evaluate how smoothly the engine runs on a single magneto. Return the key to BOTH. Repeat for the LEFT magneto. Normal RPM drop is  $\approx 80$  RPM. Maximum allowable RPM drop is 125 RPM. Maximum acceptable difference between magneto drops is 50 RPM.

**NOTE**

If RPM drop exceeds specified limits (Max. 125 RPM drop/Max. 50 RPM difference) or operates roughly, attempt to clear (“burn off”) the fouled spark plug(s) by running the engine at 2100 RPM and leaning the mixture to maximum lean. Run the engine for 45 seconds. Retest the magnetos. If the RPM drop remains excessive, attempt the “burn-off” procedure once more.

If the condition remains, return the aircraft for maintenance.

**OIL TEMPERATURE / PRESSURE ..... CHECKED**

Verify that oil pressure and oil temperature are indicating as appropriate. Oil pressure should be well in the green, while the temperature indications would depend on the amount of time the aircraft has been running.

**VACUUM GAUGE / AMMETER ..... CHECKED**

Check that the vacuum gauge indicates between 4.5” and 5.5” A high or low reading outside of this range at 1,800 RPM would indicate the need for maintenance before any IFR flight. Check that the ammeter indicates above 0, confirming that the alternator is functioning. If in doubt, add electrical load by turning on available lights and note ammeter indications. A discharge on the ammeter at 1800 RPM would imply that the alternator is not producing electrical current. Crosscheck ammeter indications against voltage if alternator output is questionable. Alternator output should be  $\approx 28$  Volts at 1800 RPM. A  $\approx 24$  Volts indication at 1800 RPM would indicate that the battery is supplying the electrical power. If troubleshoot attempts are unsuccessful, return the aircraft for maintenance.

**CAUTION**

*Departing on a flight without a functioning alternator is prohibited.*

**FUEL QUANTITY** ..... **VERIFIED**  
Check fuel gauges to ensure their operation and approximate indication of known fuel level.

**NOTE**

In accordance with FAA regulations, fuel quantity indicators must only reflect an accurate level of fuel when the fuel tanks are empty.

**ANNUNCIATOR PANEL** ..... **CLEAR**  
Check all the CAUTION and WARNING lights on the annunciator panel are EXTINGUISHED.

**THROTTLE** ..... **CHECK IDLE**  
Set the throttle to idle by pulling the throttle all the way OUT. Check to ensure that the engine will continue to run. A typical idle RPM range should be between 500-800 RPM.  
Note that during this idle check, low vacuum and low alternator output indications may occur, due to excessively low engine speed. Setting the throttle back to 1000 RPM after this check should restore normal indications and confirm the systems are operational.

**MIXTURE** ..... **(as required) LEANED FOR TAXI**  
If appropriate, lean the mixture for taxi to prevent fouling of spark plugs from excessively rich mixture during low RPM ground operations in accordance with Mixture Ground Leaning SOP of this chapter.

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**AVIONICS / TRANSPONDER** ..... **DEPARTURE**  
Verify that avionics and transponder are SET for departure. Using most recently received information (such as new ATIS, recently obtained clearance, etc.), update as necessary.

- ▶ *Set the GPS for primary navigation to intended clearance limit (IFR) or initial waypoint along a pre-planned VFR flight plan.*
- ▶ *Verify that an IFR route or VFR flight plan is entered into the GPS.*
- ▶ *Set localizer frequency for departure airport and front course on OBS 1.*
- ▶ *Use OBS 2 for positional awareness using nearest VOR, as appropriate.*

**FLIGHT / NAV INSTRUMENTS** ..... **DEPARTURE**  
Verify that flight and navigation instruments are SET for departure.

**DEPARTURE BRIEF** ..... **COMPLETED**  
Departure brief is primarily for the flight crew, but any information applicable to passengers must be included. The appropriate pilot will conduct the departure brief in accordance with, but not limited to, the following SOP.

**Departure brief (SOP)**

1. Who is the PF, who is the PMF and who is the PIC?
2. How is the control exchange handled?
3. Sterile cockpit procedures?
4. Expected taxi route?
5. Runway length and conditions?

6. Takeoff emergencies? / Bridgewater Standard Departure
7. Airspeeds? /Rotation / Climb / Emergencies
8. Altitudes and route, as appropriate
9. VFR / IFR Check
10. Any pertinent passenger/crew information or questions?

**Departure brief, expanded**

1. Who is the PF, who is the PMF and who is the PIC?
  - Determine who is the PF and who is the PMF for the takeoff and first leg
  - Determine who is the overall PIC for the flight, regardless of who is PF / PMF
2. How is the control exchange handled?
  - Brief positive three-way exchange of flight controls
3. Sterile cockpit procedures?
  - Brief sterile cockpit procedures for the specific flight
4. Expected taxi route?
  - Brief the expected taxi route to the takeoff runway
5. Runway length and conditions?
  - Brief runway length and condition, as well as any obstructions
6. Takeoff emergencies ? / Bridgewater Standard Departure
  - Brief takeoff emergencies, as per Bridgewater Standard Departure.
7. Airspeeds? /Rotation / Climb / Emergencies
  - Brief normal airspeeds to be used for takeoff and initial climb, as well as emergency airspeeds
8. Altitudes and route, as appropriate
  - Brief altitude and route for at least the first leg of the flight, if applicable
9. VFR / IFR Check
  - If flying VFR confirm that VFR departure is possible
    - Confirm that the transponder is set to the appropriate VFR code
  - If flying IFR
    - Confirm clearance obtained
    - The aircraft clock is SET and operating as required by FAR 91.205
    - Confirm that t aircraft navigation and communication radios are SET to the appropriate departure frequencies
    - Confirm that the transponder is SET to the appropriate code
    - Confirm procedure in the event of loss of communication with ATC
    - Confirm that the flight instruments are operating properly
11. Any pertinent passenger/crew information or questions?
  - Address the passengers with any pertinent information not covered previously during passenger brief
  - Check if the other crewmembers and passengers have any questions

**Bridgewater Standard departure (SOP)**

BSU Standard emergency flows will be followed and backed up with the checklists if time permits. In case of an actual emergency, the lesson will be terminated and the flight crew will work as a team to bring the flight to a safe conclusion. The following general guidelines should be observed but will not substitute sound judgment and PIC authority to take whatever action necessary to meet the extent of an emergency.

*Any abnormalities before  $V_R$  – abort takeoff and taxi off active runway.*

*Engine failure after rotation with usable runway remaining – land on it.*

*Engine failure below 1000' AGL - establish best glide, pick a spot straight ahead and land under control using shallow banks and normal maneuvers.*

*Engine failure at or above 1000' AGL – establish best glide, troubleshoot the failed engine if time permits and consider the possibility of returning to the airport or another landing area.*

**Sample Departure Briefing**

In this example, the pilot conducting the brief is the student (PF/PIU).  
The instructor is the PIC and, initially, the PMF.

- ✓ “I will be flying the plane and you are the PIC”
- ✓ “Positive three-way exchange of flight controls at all times”
- ✓ “Sterile cockpit below 1000' AGL unless instructionally necessary”
- ✓ “Expecting taxi to Runway 23 for a normal takeoff”
- ✓ “Runway 23 is 5000' long and dry”
- ✓ “Bridgewater Standard departure “ (expand if necessary with specifics)
- ✓ “Rotating at ... KIAS; climbing at ... KIAS; best glide airspeed is ... KIAS” (state actual airspeeds for the operation)
- ✓ “Northbound VFR departure after reaching 1000' AGL to practice area Charlie”
- ✓ “Any questions? “

**TAKEOFF / AT RUNWAY**

DOORS / WINDOWS..... LATCHED  
 TRIM ..... TAKEOFF  
 FLAPS.....TAKEOFF / CONFIRMED OUTSIDE  
 ENGINE INSTRUMENTS ..... CHECKED  
 HDG and RWY HDG..... SET / CHECKED

LIGHTS / PITOT HEAT..... (as required) ON  
 MIXTURE..... RICH  
 TRANSPONDER ..... ALT  
 ► TAKEOFF ROLL CHECKS..... COMPLETE

**TAKEOFF / AT RUNWAY, EXPANDED**

**DOORS / WINDOWS ..... LATCHED**  
 Verify that all doors and windows are closed and latched securely for departure.

**TRIM ..... TAKEOFF**  
 Set the trim wheel to TAKEOFF position. Verify visually.

**FLAPS .....TAKEOFF / CONFIRMED OUTSIDE**  
 Set flaps for TAKEOFF and confirm visually that actual flaps position corresponds to the flap lever setting.

**ENGINE INSTRUMENTS ..... CHECKED**  
 Recheck the engine instruments to ensure normal indications prior to takeoff.

**HDG and RWY HDG ..... SET / CHECKED**  
 Recheck the heading indicator against the compass and reset to the correct heading if necessary. It is normal for the heading indicator to have precessed during taxi operations, and to be significantly off the actual heading. Set the heading bug to the departure runway.

► *Pilots are reminded that the ATC expects prompt compliance after takeoff clearance has been issued/received. The PF may choose to perform the following steps after takeoff clearance has been received (towered airports) or when ready to enter the departure runway (non-towered airports). In all cases, these steps will be accomplished prior to the aircraft moving from the hold short line.*

**LIGHTS / PITOT HEAT.....(as required) ON**  
 Ensure the BEACON light remains on at all times. Utilize the LANDING, TAXI and STROBE lights for maximum visibility on takeoff. Verify that NAV lights are ON if at night. Turn the pitot heat ON if visible moisture is present and pitot tube blockage possibility exists.

**MIXTURE ..... RICH**  
 Set the MIXTURE control to FULL RICH (full forward) position. Refer to the POH / AFM for operations at airports above 3000 feet density altitude.

**TRANSPONDER ..... ALT**

Set the transponder to ALTITUDE reporting mode (ALT) in order to transmit the transponder code (Mode A) and the altitude readout (Mode C).

- ▶ **TAKEOFF ROLL CHECKS..... COMPLETE**  
*Complete the takeoff roll checks and perform the appropriate callouts.  
 Abort takeoff if the checks are unsatisfactory.*

**TAKEOFF ROLL Checks (SOP)**

- CORRECT RUNWAY ..... VERIFIED**
- POWER INDICATIONS ..... NORMAL**
- ENGINE INSTRUMENTS ..... NORMAL**
- AIRSPEED ..... ALIVE**

**TAKEOFF ROLL Checks, Expanded**

**CORRECT RUNWAY ..... VERIFIED**

To ensure takeoff is conducted on the correct runway, crosscheck the painted runway numbers against the heading indicator and the magnetic compass. Do this check once established on the runway centerline and before applying takeoff power.

**POWER INDICATIONS ..... NORMAL**

Immediately upon applying full power, check the RPM for full power indications (2065 – 2165 at sea level).

**ENGINE INSTRUMENTS ..... NORMAL**

As the airplane starts the takeoff roll, check the oil pressure, engine temperatures and fuel flow indicators.

**AIRSPEED ..... ALIVE**

Check that the airspeed indicator needle indicates proper movement.

**CLIMB**

**FLAPS** ..... UP  
**TRANSPONDER** ..... VERIFY on ALT  
**ENGINE INSTRUMENTS** ..... CHECKED / MONITOR  
**AIRSPEED (1000 AGL)** ..... (as required) CRUISE CLIMB

**CLIMB, EXPANDED**

► *Begin the Climb checklist when passing through 500' AGL.*

**FLAPS** ..... UP  
Verify that the flaps are fully retracted when it is safe to do so.

**TRANSPONDER** ..... VERIFY on ALT  
Check the transponder and verify that it is set to the ALT mode and is transmitting a correct VFR/IFR squawk code.

**ENGINE INSTRUMENTS** ..... CHECKED / MONITOR  
Check engine instrument indications, paying particular attention to oil pressure, oil temperature. Any serious abnormality at this point would necessitate a carefully considered and immediate action while engine power is still available. Monitor engine instruments, particularly the oil temperature, throughout the climb to guard against overheating the engine.

**AIRSPEED (1000 AGL)**..... (as required) CRUISE CLIMB  
Upon departing the traffic pattern, if conditions permit, transition to cruise climb airspeed (≈85-90 KIAS). This will provide increased collision avoidance in busy terminal / training areas by allowing greater visibility over the nose. It will also provide for better engine cooling due to increased airflow through the engine.

**CRUISE**

CRUISE POWER .....SET  
 MIXTURE..... (as required) LEANED  
 LIGHTS..... (as required) ON  
 HEADING INDICATOR (every 20 min).....CHECKED / ALIGNED

**CRUISE, EXPANDED**

**CRUISE POWER .....SET**

Set power (throttle) for cruise to predetermined RPM setting in accordance with the POH / AFM.

**MIXTURE..... (as required) LEANED**

Lean the mixture in accordance with the POH / AFM and the engine operating instructions to obtain the best fuel flow for segment to be flown, as appropriate to the density altitude and operating conditions. Reference fuel flow gauges and exhaust gas temperature (EGT) gauges to achieve optimal setting.

**LIGHTS..... (as required) ON**

Turn or leave ON appropriate lights to maximize aircraft visibility and to comply with the regulations regarding lights during flight operations.

**DAYTIME:** In addition BEACON LIGHT, verify that STROBE LIGHTS are ON and leave them on for anti-collision purposes for the entire flight, as required by FAR 91.209(b). One exception is strobe lights should be turned off in flight when there are adverse reflections from clouds. Leave the LANDING and TAXI LIGHTS ON while remaining within 10 miles of any airport or in areas of reduced visibility and where flocks of birds may be expected, in accordance with FAA Guidance (operation “Lights On”, see AIM 4-3-23)

**NIGHTTIME:** Verify that STROBE LIGHTS are ON in accordance with the guidance in previous paragraph. Verify that LANDING and TAXI LIGHTS are ON and leave on for the entire flight. Verify that NAV LIGHTS are ON and leave them on if any portion of the flight can potentially occur during the period between sunset and sunrise, as required by FAR 91.209(a).

**HEADING INDICATOR / COMPASS (every 20 min)..... ALIGNED**

Check and verify that heading indicator accurately reflects magnetic compass heading. Reset if necessary. Check the heading indicator against the compass at least every **20 minutes**. More frequent checks may be necessary under turbulent conditions or during maneuvers.

**DESCENT / APPROACH**

SEATBELTS ..... CHECKED  
 FUEL SELECTOR (feel for detent) ..... BOTH  
 MIXTURE ..... FULL RICH < 3000'  
 LIGHTS ..... (as required) ON

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DESTINATION INFO / WX ..... OBTAIN  
 ALTIMETER ..... SET  
 APPROACH BRIEF ..... COMPLETE

**DESCENT / APPROACH, EXPANDED**

**SEATBELTS / HARNESSSES ..... SECURE**  
 Make sure that seats are locked in place and seatbacks are fully upright and secure. Verify that all occupants have their seatbelts and shoulder harnesses securely fastened.

**FUEL SELECTOR (feel for detent) ..... BOTH**  
 Verify the fuel selector is on BOTH in preparation for terminal operations and landing.

**MIXTURE ..... FULL RICH < 3000'**  
 Enrichen the mixture during descent to compensate for higher density air at lower altitudes. Ensure the mixture is set to FULL RICH when descending through 3,000 feet for a landing.

**LIGHTS ..... (as required) ON**  
 The goal is to be as visible as possible. Verify that the BEACON, LANDING, TAXI and STROBE lights are on in preparation for landing. If at night, verify that the NAV lights are on. See lights explanation in Cruise checklist for additional guidance and for references to appropriate FARs.

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**DESTINATION INFO / WX ..... OBTAIN**  
 Obtain ATIS / ASOS / AWOS, etc. reports at the destination airport and plan the approach accordingly.

**ALTIMETER ..... SET / VERIFIED**  
 Set the altimeter to the appropriate altimeter setting, received in the previous step.

**APPROACH BRIEF ..... COMPLETE**  
 No later than five (5) miles from the airport of intended landing when arriving from outside of the traffic pattern, conduct the approach brief appropriate to the type of arrival. Include any pertinent information in accordance with the SOP.

**Approach Brief (SOP)**

Tailor the approach brief to the particular situation. Include any other pertinent information.

**IFR Flight (actual or simulated)**

APPROACH PROCEDURE.....	CONFIRM CORRECT
COMM / NAV / PCL Frequencies .....	SET and IDENT
GPS status, RAIM and OBS Coupling .....	REVIEW and SET
Final approach course .....	REVIEW AND SET
MSA and TDZ elevation .....	REVIEW
FAF Altitude and MDA / DA .....	REVIEW
Time from FAF to MAP (if applicable).....	REVIEW
Missed Approach Point / Procedure .....	REVIEW

**VFR Flight**

COMM / NAV / PCL Frequencies .....	SET and IDENT
Traffic pattern altitude .....	REVIEW
Direction of traffic (expected or indicated) .....	REVIEW
Arrival runway and condition .....	REVIEW
Intended touchdown point .....	REVIEW
Type of landing and how it will terminate.....	REVIEW

**Sample VFR approach brief:**

“Tower is 118.1 and ATIS is 126.85 tuned and received; TPA is 1100 MSL; expect right traffic; runway 23, dry and paved; 1000 ft. markers; normal landing to full stop.”

**BEFORE LANDING**

▶ **PATTERN OPERATIONS BRIEF** ..... **COMPLETED**  
**LIGHTS**..... **ON**  
**MIXTURE**..... **FULL RICH**

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**FLAPS** ..... (as required) **SET**

**BEFORE LANDING, EXPANDED**

▶ **PATTERN OPERATIONS BRIEF** ..... **COMPLETED**  
*Conduct this brief during repetitive traffic pattern operations.*

**Pattern Operations Brief (SOP)**

This brief is to be used during repetitive traffic operations and shall be conducted on the downwind leg, prior to initiating Before Landing checklist.

Landing runway ..... **REVIEW**  
 Intended touchdown point ..... **REVIEW**  
 Type of landing and how it will terminate ..... **REVIEW**

**Sample Pattern Operations Brief:**

“Landing runway 23, thousand foot markers, normal landing to full stop”

**LIGHTS**.....(as required) **ON**

The goal is to be as visible as possible. Verify that the BEACON, LANDING, TAXI and STROBE lights are on in preparation for landing. If at night, verify that the NAV lights are on. See lights explanation in Cruise checklist for additional guidance and for references to appropriate FARs.

**MIXTURE**.....**FULL RICH**

Set/Verify the mixture is in FULL RICH (full forward) position, to ensure smooth engine operation during landing and in case of a go-around.

**FLAPS**..... (as required) **SET**

Set flaps for landing, as required by the conditions.

**GO-AROUND (SOP)**

**POWER (MIXTURE / THROTTLE)** ..... **FULL FORWARD**  
**FLAPS (if full)** ..... **RETRACT to 20°**  
**POSITIVE RATE OF CLIMB** ..... **FLAPS 20° to 10°**  
 ► **IF OBSTACLES (until clear)** ..... **CLIMB AT V<sub>x</sub> (60 KIAS) / FLAPS 10°**  
**FLAPS (above 60 KIAS and clear of obstacles)** ..... **10° to 0° (up)**  
**AIRSPEED (once clear of obstacles)** ..... **V<sub>y</sub> (79 KIAS)**  
 ► **CLIMB CHECKLIST** ..... **EXECUTE**

**GO-AROUND (SOP), EXPANDED**

**POWER** ..... **FULL FORWARD**  
 Immediately, apply throttle all the way forward for maximum power. If the engine hesitates or fails to produce full power, ensure that the mixture is also all the way forward. This may occur if a go-around is attempted at lower altitudes with the mixture still leaned for cruise at a higher altitude, and never readjusted during the descent.

**FLAPS (if full)** ..... **RETRACT to 20°**  
 If the flaps are fully down at 30°, retract them immediately to 20°

**POSITIVE RATE OF CLIMB** ..... **FLAPS 20° to 10°**  
 When positive rate of climb is indicated outside, on the altimeter and the VSI, and the possibility of touching down on the remaining runway no longer exists, retract the flaps from 20° to 10°.

► **IF OBSTACLES (until clear)** ..... **CLIMB AT V<sub>x</sub> (60 KIAS) / FLAPS 10°**  
 If obstacles exist and maximum angle of climb is desired, continue climbing at V<sub>x</sub> (60 KIAS) with flaps at 10° until obstacles are cleared.

**FLAPS (above 60 KIAS and clear of obstacles)** ..... **10° to 0° (up)**  
 When above 60 KIAS and clear of obstacles, retract flaps from 10° to 0° (full up) while accelerating to V<sub>y</sub>.

**AIRSPEED (once clear of obstacles)** ..... **V<sub>y</sub> (79 KIAS)**  
 Continue climbing at V<sub>y</sub>, or as appropriate, once the flaps have been retracted and obstacles cleared.

► **CLIMB CHECKLIST** ..... **EXECUTE**  
 Perform the Climb Checklist flow and complete the checklist as soon as practical.

**AFTER LANDING**

TRIM..... TAKEOFF  
 FLAPS ..... UP / CONFIRMED  
 MIXTURE.....(as required) LEANED FOR TAXI  
 LIGHTS..... (as required) OFF  
 TRANSPONDER ..... (as required) STANDBY

**AFTER LANDING, EXPANDED**

**TRIM .....TAKEOFF**  
 Set the trim wheel to TAKEOFF position.

**FLAPS ..... UP/ CONFIRMED**  
 Retract the flaps and confirm that the flaps are fully UP.

**MIXTURE.....(as required) LEANED FOR TAXI**  
 If appropriate, lean the mixture for taxi to prevent fouling of spark plugs from excessively rich mixture during low RPM ground operations in accordance with Mixture Ground Leaning SOP of this chapter.

**LIGHTS.....(as required) OFF**  
 Turn the LANDING LIGHT OFF. BEACON LIGHT shall remain ON at all times. Use other lights as appropriate for safety and to comply with the regulations regarding lights during ground operations.

**DAYTIME:** Leave STROBE LIGHTS ON for anti-collision purposes on the ground, as required by FAR 91.209(b). One permitted exception is strobe lights should be turned off on the ground when they adversely affect ground personnel or other pilots.

**NIGHTTIME:** Turn the STROBE LIGHTS OFF (except when on a runway). Leave the NAV LIGHTS ON if any portion of the flight can potentially occur during the period between sunset and sunrise, as required by FAR 91.209(a). Use the TAXI LIGHT as necessary during ground operations, except avoid shining your light at other aircraft.

**TRANSPONDER .....(as required) STANDBY**  
 Set the transponder to STBY (STANDBY) mode to discontinue transmitting the squawk code (Mode A) and altitude (Mode C) information.

**NOTE**

At some large airports, the transponder Mode C reply is used to monitor aircraft on the surface of the airport. At those airports, the transponder should be left in ALT mode during all ground operations unless otherwise requested by ATC. Consult the A/FD for the particular airport you are planning to use to see if such operations are in effect.

**SHUTDOWN**

AVIONICS SWITCH.....	OFF
THROTTLE.....	IDLE
MAGNETO GROUNDING .....	CHECKED
MIXTURE.....	IDLE CUT- OFF
PANEL ELECTRICAL SWITCHES (except BEACON) .....	OFF
MASTER SWITCH.....	OFF
IGNITION SWITCH and KEY .....	OFF and OUT
CONTROL LOCK.....	INSTALLED
PARKING BRAKE .....	AS REQUIRED
<hr/>	
AIRCRAFT SECURE (SOP).....	COMPLETE

**SHUTDOWN, EXPANDED**

**AVIONICS SWITCH..... OFF**  
 Turn the avionics switch to OFF to prevent potential damage to the avionics from electrical current surge during shutdown.

**THROTTLE.....IDLE**  
 Set the throttle to IDLE (full out).

**MAGNETO GROUNDING .....CHECKED**  
 Turn the IGNITION KEY to OFF, but only MOMENTARILY, and immediately return it to BOTH. The engine should quit running momentarily, and start running again when the magnetos are restored. If the engine continues running in the OFF position, a problem exists with magneto grounding and it must be reported to Dispatch / Maintenance immediately.

**MIXTURE..... IDLE CUT- OFF**  
 With the engine running, set the mixture to IDLE CUT-OFF (full back) position in order to starve the engine of fuel and shut it down.

**PANEL ELECTRICAL SWITCHES (except BEACON) .....OFF**  
 Right to left, turn OFF all electrical switches (except BEACON) on the panel below the yoke. Leave the BEACON LIGHT ON in accordance with “live aircraft” concept (described earlier in this chapter).

**MASTER SWITCH..... OFF**  
 Turn OFF both sides of the red master switch.

**IGNITION SWITCH and KEY ..... OFF and OUT**  
 Turn OFF the ignition / magnetos switch with the key. Gently check if the key can be easily removed in either left or right magneto position. That would indicate a worn out lock/key and must be reported to Dispatch/Maintenance. Continue to the OFF position and remove the key. Never allow the key to remain in the ignition lock unless the engine is running.

**CONTROL LOCK .....INSTALLED**  
 Install the control lock in the yoke column.

**PARKING BRAKE.....AS REQUIRED**

If the aircraft is to be tied down or wheel chocks are to be used, leave the parking brake OFF. Consider setting the parking brake ON if tie down locations or wheel chocks are unavailable.

**AIRCRAFT SECURE (SOP)..... COMPLETED**

*Secure the aircraft in accordance with the SOP.*

**Aircraft Secure (SOP)**

Tie downs (3).....	ATTACHED
Pitot mast cover.....	INSTALLED
Cowl plugs.....	INSTALLED
Extension cord(as appropriate) .....	PLUGGED IN
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Hobbs time .....	RECORDED
Tachometer times (2) .....	RECORDED
Squawks .....	RECORDED
Cabin and Baggage Areas .....	CLEAN
Personal items .....	REMOVED
Window(s).....	SECURED
Cabin and baggage doors .....	SECURED
Aircraft .....	LOCKED



## **C172R Skyhawk Flight Standards Manual**

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