

**Chapter 3A
Normal Procedures**

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General

This chapter contains the approved Bridgewater State College Normal Procedures for operating the PA-28R-200 Arrow. The procedures are based and in some cases expand on the manufacturer procedural recommendations.

Flight crews are expected to thoroughly familiarize themselves with the contents of this chapter prior to operating the aircraft.

Use of the Checklist

Flight crews will follow the procedures within the Normal Checklist. The checklist is arranged by phase of operation (ground operations, takeoff, climb, cruise, descent, approach, landing, parking). It contains the approved procedures to be followed by BSC flight crews and shall be carried onboard the aircraft, readily accessible to the flight crew *at all times*. The procedures are based upon flight crew knowledge of aircraft systems and system interrelation. As such, some checklist items may be a condensed version of the procedures contained within the approved Pilot's Operating Handbook/Aircraft Flight Manual. Situations presenting an immediate risk are identified on the separate Emergency Checklist for rapid and accurate action and must be accomplished from memory. Flight crews shall refer to the Emergency Checklist as warranted by the situation at hand.

CAUTION

Flight crews shall execute the appropriate checklist procedures in response to an emergency situation. In the event of an emergency, the Pilot-In-Command may deviate from the Emergency Checklist procedures as necessary to ensure the safe outcome of the flight.

Checklists in this and all Bridgewater State College standards manuals are printed in a manner to indicate the preferred method and sequence of execution. The checklist shall be initiated when the Pilot Flying (PF) calls for the appropriate checklist. Tasks on the checklist may be performed prior to reference to the physical checklist, *but the checklist tasks shall be verified with the checklist in-hand.*

If completion of a checklist sequence is interrupted, flight crews shall return to the checklist as necessary, including starting from the beginning if required, and *ensure that checklist tasks have actually been completed* when the checklist is reported as "COMPLETE".

1. Challenge and Response (C/R)

Checklists with the "C/R" in the title box are composed of Challenge and Response tasks. Under normal training conditions the pilot under instruction will execute all checklists operating as a single pilot. All BSC pilots conducting non-training flights are encouraged to practice Challenge and Response checklist methods, and to demonstrate this method at any time to pilots under instruction.

Fuel Pump.....ON

2. Verbal Response Only (V/R)

Checklists with the “V/R” in the title box are composed of tasks for which the pilot completing the checklist verbalizes both the task and the response.

Magnetos.....CHECKED

In the example above, the pilot would ground check the magnetos, then state “Magnetos ground checked.”

3. Non-Response (N/R)

Checklists with the “N/R” in the title box are composed of tasks that do not require any verbal response.

Circuit Breakers.....CHECKED/IN

4. ^R Tasks

Tasks preceded by a superscript “R” are the only tasks required on flights consisting of repetitive landing operations.

5. ^B Tasks

Tasks preceded by a superscript “B” are, as expected, “B” items, and are the only preflight tasks required to be conducted after the initial preflight on any flight that will consist of multiple stops by the same flight crew.

6. Conditional Responses

1. “CHECKED”

“CHECKED” serves as a generic checklist response corresponding to completion of operational status, condition, or equipment tests.

Brakes.....CHECKED

2. “AS REQUIRED”

“AS REQUIRED” serves as a response when more than one status option is available. The pilot completing the task shall verbalize the *actual condition of the checklist item*. For example:

Flaps.....AS REQUIRED
This would be verbalized, “Flaps 10⁰” or as appropriate depending on condition of the flaps.

Checklist Sequence

Flow Pattern

The normal and emergency checklists provided in this manual provide flight crewmembers with both an abbreviated list and the corresponding expanded description of tasks to be accomplished. These checklists are designed to be performed using “flow” patterns: Procedural steps are completed in such a manner as to “flow” from one area of the cockpit to the next in a logical and smooth manner. This method enhances pilot visual and physical habit patterns, and increases efficiency in completing the required tasks. When practiced properly, this method also serves to more readily alert a pilot if a step in any flow pattern is missed. Flows may be accomplished prior to the use of the actual checklist. Regardless, *all BSC checklists must be executed and verified with the checklist in-hand.*

Acceptance Checklist

The Aircraft Acceptance Checklist is to ensure the general airworthiness of the aircraft. The checklist must be accomplished each time there is a flight crewmember change, or maintenance is performed on the aircraft. It may also be conducted at any other time at the discretion of the Pilot-In-Command. During normal operations the Aircraft Acceptance Checklist is accomplished by the student, however it is the responsibility of the Flight Instructor to ensure that all required checks have been completed.

Subsequent Checklists

All subsequent checklists will be completed at their appropriate time, and in the manner indicated in the specific checklist.

Aircraft Can Acceptance

The aircraft can is to be kept by BSC Dispatch until released for flight or aircraft maintenance. Once released for flight the can then becomes the responsibility of the flight crew. The can shall be kept in the cockpit during flight.

The can shall be checked for:

✚ Daily Flight Data Sheet

1. Correct aircraft tail number
2. Correct date
3. Correct aircraft make and model
4. Correct pilot name and ID #
5. Ensure that either beginning Tach and Hobbs time, first flight of the day, or ending Tach and Hobbs time, subsequent flights, are correct prior to engine start. Contact Dispatch regarding any discrepancy.
6. Check Next Annual, 100 and 50 Hr. Inspection Due: Tach times. *Ensure that NO Tach time exceeds either limit.*
7. Check the Aircraft, VOR, and GPS Data Card inspection times remaining and due dates. *Ensure that there are no mathematical discrepancies and that the aircraft has not exceeded the Next Inspection dates on any item.*

⊖ Aircraft discrepancy sheet

1. The Pilot-In-Command will check this for any open discrepancy items.

NOTE

Aircraft may not be flown with open discrepancy items. Any open discrepancy items must be repaired or deferred by Maintenance prior to flight.

✚ Aircraft Inspection Summary

1. Ensure that all Aircraft Inspection Summary sheets are for the correct aircraft.
2. Ensure that the Transponder, Altimeter, Static System, Mode C, ELT Battery Replacement, and 100 hour and Annual inspections *have not exceeded their respective due dates.*
3. Check that the aircraft inspection has been signed on the Maintenance Inspector and the Inspection Authorization (IA) lines.

4. Ensure that the aircraft is in compliance with all Airworthiness Directives and Service Bulletins, *and will not exceed any respective limits/due dates during the flight.*
5. Check that the aircraft Weight & Balance data matches what has been used to calculate the Bridgewater State College Takeoff and Landing Data Card.

NOTE

The Aircraft Inspection Summary is not an official Weight & Balance document. Official Weight & Balance data can be found in the Approved Airplane Flight Manual issued for and aboard the specific aircraft.

ⓘ VOR Accuracy Check

Check the date for the last VOR check. This check must be completed per 14 CFR Section 91.171 for all civil aircraft under IFR using the VOR system for radio navigation. *If the 30-day limit is nearly due, flight crews are asked to complete the VOR check to prevent expiration of the check's validity.*

Flight Crew Conduct

This section delineates procedures to be followed by flight crews during normal operations. For situations requiring use of the Emergency Checklist procedures, flight crews can refer to Chapter 4, Emergency Procedures in the Flight Standards Manual. The checklists contained in this section provide flight crews with a list of the tasks to be accomplished in the aircraft. Those same checklists and associated tasks are explained in detail in the expanded section of the chapter. The checklists may be accomplished from memory, if appropriate, *and then verified with the checklist in-hand.*

NOTE

Any flight crew conducting an emergency procedure checklist on the ground in response to an actual emergency shall return the aircraft to the ramp for maintenance action.

CAUTION

BSC Flight Instructors are the PIC on any dual flight training event and are therefore responsible for the safe outcome of the flight. In any emergency, the PIC may request the flight controls from the PF if necessary.

Speed vs. Efficiency in Task Execution

The most important and sophisticated technology in the aircraft is the pilot’s mind. His/her ability to analyze a rapidly changing situation, determine a desired outcome, select from available alternatives, act on the decision, evaluate the result and if necessary conduct that sequence several times over, presents the very best chance for a successful outcome. Where a pilot acts first, rushing through tasks and making mistakes, precious time is wasted by having to repeat previously missed steps in a procedure. In normal flight situations, there is always time to think first, and then act efficiently and effectively: The result prevents mistakes and the associated loss of time available to the flight crew.

All tasks in the approved Bridgewater State College Normal Checklists are to be completed in sequence, smoothly, accurately, and efficiently. Although the completion of tasks will follow a specified sequence, certain sequences may be performed nearly simultaneously. Instructors and students are expected to review and rehearse these procedures as necessary to achieve and maintain the expected level of proficiency.

During training operations, single-pilot execution of any normal procedure listed in the chapter will be executed using the Verbal Response method.

Normal Procedures Checklist

V/R	AIRCRAFT ACCEPTANCE
Aircraft Surfaces.....	CLEAR
Windows/Windscreen.....	CLEAN/NO DAMAGE
Maintenance Status.....	VERIFIED/CLEARED
Hobbs Meter.....	RECORDED
Tachometer Time.....	RECORDED
Carbon Monoxide Detector.....	CHECKED
Fire Extinguisher.....	CHARGED/SECURED
Aircraft Documents.....	CHECKED
Aircraft Cabin Area.....	CLEAN/NO DAMAGE
A/C Acceptance Checklist.....	COMPLETE

N/R	PRE-FLIGHT INSPECTION
------------	------------------------------

Flight Controls.....FREE/CORRECT
^BParking Brake.....SET
^BIgnition Switch.....OFF
^BBattery Master Switch.....OFF
Pitot/Static System.....DRAIN
ELT.....ARMED
Fuel Selector..... CHECKED/SET
Magnetos.....OFF
^BGear Handle.....DOWN
Mixture.....IDLE CUT-OFF
Avionics Master Switch.....OFF
All Electrical Switches.....OFF
^BBattery Master Switch.....ON
^BLanding Gear Lights.....ALL ON
Fuel Gauges.....CHECKED
Annunciator Lights.....CHECKED
^BCockpit/Exterior Lights.....CHECKED/OFF
Stall Warning Vane.....CHECKED
Pitot Heat.....CHECKED/OFF
Comm/Nav Radios.....CHECKED
^BBattery Master Switch.....OFF
Circuit Breakers.....CHECKED
^BFlaps.....DOWN

RIGHT WING

Flap, Aileron, Hinges..... CHECKED
Static Wicks.....CHECKED/SECURE
^BWing Tip/Lights.....CHECKED
Wing Leading Edge.....CHECKED
^BFuel Level and Cap.....CHECKED/SECURE
^BFuel Tank Vent.....UNOBSTRUCTED
^BTie Down.....REMOVED/STOWED |
Wing Inspection Plates.....SECURE
Fuel Tank Sump.....DRAIN
^BLanding Gear, Main.....CHECKED
Fresh Air Inlet.....UNOBSTRUCTED

NOSE

Windscreen.....	CLEAN/NO DAMAGE
^B Oil Level/Dipstick.....	CHECKED/SECURED
^B Oil Filler Cap.....	REPLACED/SECURE
Oil Door.....	CLOSED/SECURE
Cowling.....	NO/DAMAGE/SECURE
Cowl Intakes.....	UNOBSTRUCTED
Engine Baffles.....	CHECKED
Air Inlets.....	UNOBSTRUCTED
Alternator Belt.....	CHECKED
^B Propeller and Spinner.....	CHECKED
^B Landing Light.....	CHECKED
^B Landing Gear, Nose.....	CHECKED
Intake Hoses.....	CHECKED
Fuel Strainer.....	DRAIN

LEFT WING

Fresh Air Inlet.....	UNOBSTRUCTED
B.G.E. Mast (If Installed).....	CHECKED
^B Landing Gear, Main.....	CHECKED
Fuel Tank Sump.....	DRAIN
Wing Inspection Plates.....	SECURE
^B Tie Down.....	REMOVED/STOWED
Fuel Tank Vent.....	UNOBSTRUCTED
^B Fuel Level and Cap.....	CHECKED/SECURE
Wing Leading Edge.....	CHECKED
Pitot Mast.....	CHECKED
^B Wing Tip/Lights.....	CHECKED
Static Wicks.....	CHECKED/SECURE
Aileron, Flap, Hinges.....	CHECKED

FUSELAGE, LEFT

Antennas.....	SECURE/NO DAMAGE
Air Inlets.....	UNOBSTRUCTED
Empennage.....	CHECKED
^B Stabilator/Servo Tab.....	CHECKED
Rudder.....	CHECKED
^B Tie Down.....	REMOVED/STOWED

FUSELAGE, RIGHT

^B Stabilator/Servo Tab.....	CHECKED
Battery Box Vent/Drains.....	CHECKED/UNOBSTRUCTED
External Power Receptacle.....	CHECKED/SECURE
Landing Gear Pump.....	CHECKED
Baggage Area (Tow Bar If Installed).....	SECURE
^B Baggage Door.....	CHECKED/SECURE
^B Pre-Flight Inspection Checklist.....	COMPLETE

C/R	BEFORE ENGINE START
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Aircraft Acceptance Check.....COMPLETE
 Pre-Flight Inspection.....COMPLETE
 Passenger Briefing.....COMPLETE
 Seats/Belts/Harnesses.....CHECKED/LATCHED
 Flaps.....UP
 Parking Brake.....SET
 Avionics Master.....OFF
 Circuit Breakers.....CHECKED/IN
 Alternate Air.....CLOSED
 Propeller.....FULL INCREASE
 Fuel Selector.....LOWEST TANK
 Before Engine Start Checklist.....COMPLETE

C/R	ENGINE START
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Battery Master Switch.....ON
 Alternator Switch.....ON
 External Lights.....AS REQUIRED

(NORMAL)

Throttle.....OPEN ^{1/2} INCH |
 Fuel Pump.....ON
 Mixture.....RICH, NOTE FF, IDLE CUT-OFF
 Propeller Area.....VERIFY L/C/R CLEAR
 Starter.....ENGAGE
 Mixture.....FULL FORWARD
 Throttle.....800-1000 RPM
 Oil Pressure.....CHECKED

(HOT START)

Throttle.....OPEN ^{1/2} INCH |
 Fuel Pump.....ON
 Mixture.....IDLE CUT-OFF
 Propeller Area.....VERIFY L/C/R CLEAR
 Starter.....ENGAGE
 Mixture.....FULL FORWARD
 Throttle.....800-1000 RPM
 Oil Pressure.....CHECKED

****COMPLETE FOR ALL STARTS****

Avionics Master.....ON
 Fuel Pump.....OFF
 Mixture.....LEAN
 Engine Instruments.....CHECKED
 Engine Start Checklist.....COMPLETE

C/R	TAXI
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Avionics.....SET AS REQUIRED
 Transponder.....VERIFY STDBY
 External Lights.....AS REQUIRED
 Taxi Area.....VERIFY L/C/R CLEAR
 Parking Brake.....RELEASE
 Brakes and Steering.....CHECKED
 Flight Instruments.....CHECKED
 Taxi Checklist.....COMPLETE

C/R	BEFORE TAKEOFF
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Heading.....INTO WIND
 Parking Brake.....SET
 Fuel Selector.....SWITCH TANKS
 Fuel Quantity.....VERIFY
 Cabin Heat/Defrost.....AS REQUIRED
 Flight Controls.....FREE/CORRECT
 Brakes.....HOLD

RUN-UP CHECK

Mixture.....RICH
 Throttle.....2000 RPM
 Engine Instruments.....CHECKED
 Propeller.....EXERCISE
 Alternate Air.....CHECKED
 Suction Gauge.....4.9 – 5.1 Hg
 Caution/Warning Lights.....CHECKED
 Magnetos.....CHECKED
 Ammeter.....CHECKED
 Throttle.....IDLE
 Mixture.....LEAN

AFTER RUN-UP CHECK

Quadrant Friction.....SET
 Aux. Vacuum (If Installed).....CHECKED/OFF
 Flight Instruments.....SET
 Navigation Radios/GPS.....SET TAKEOFF
 Trim.....SET TAKEOFF
 Departure Briefing.....COMPLETE
 Taxi Route.....OBTAIN/VERIFY
 Parking Brake.....RELEASE
 Before Takeoff Checklist.....COMPLETE

V/R	LINE-UP
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TrimSET/CHECKED
 Flaps.....SET/CHECKED
 Air Conditioning (If Installed).....OFF
 Alternate Air.....CLOSED
 Propeller.....FULL INCREASE
 Fuel Pump.....ON
 Heading Indicator/Compass.....CHECKED
 Flight Instruments.....CHECKED
 Engine Instruments.....CHECKED
 Fuel Selector.....FULLEST TANK
 Door.....CLOSED/LATCHED

AFTER CLEARED ON TO RUNWAY

Time Off.....NOTE
 Mixture.....FULL RICH
 External Lights.....AS REQUIRED
 Transponder.....ON/ALT
 RWY Alignment.....SET/VERIFY
 Line-Up Checklist.....COMPLETE

V/R	CLIMB
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^RLanding Gear.....UP
^RFlaps.....UP
^RClimb Power.....SET
 Fuel Pump (1000' AGL or Above).....OFF
^REngine Instruments.....CHECKED
^RTransponder.....VERIFY ALT
 Climb Checklist.....COMPLETE

V/R

CRUISE

Cruise Power.....SET
 Mixture.....LEAN AS REQUIRED
 Engine Instruments.....CHECK
 Trim.....AS REQUIRED
 Heading Indicator/Compass.....CHECK
 External Lights.....AS REQUIRED
 Cruise Checklist.....COMPLETE

V/R

DESCENT

Seats/Seatbelts/Harnesses.....CHECKED
 Mixture.....ADJUST W/DESCENT
 Gear Warning Horn.....CHECKED
 Throttle.....AS REQUIRED
 Descent Checklist.....COMPLETE

C/R

APPROACH

^RApproach Briefing.....COMPLETE
^RFuel Pump.....ON
 External Lights.....AS REQUIRED
 Air Conditioning (If Installed).....OFF
^RFuel Selector.....FULLEST TANK
 Parking Brake.....VERIFY RELEASED
^RApproach Checklist.....COMPLETE

C/R

BEFORE LANDING

^RLanding Gear.....DOWN / 3 GREEN
^RFlaps.....AS REQUIRED
^RPropeller.....FULL INCREASE
^RMixture.....FULL RICH
^RBefore Landing Checklist.....COMPLETE

C/R	GO-AROUND
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Pitch.....LEVEL ATTITUDE
 Propeller.....FULL INCREASE
 Throttle.....FULL FORWARD
 Pitch.....POSITIVE CLIMB ATTITUDE
 Flaps (If Fully Deployed).....RETRACT to 25°
 Airspeed.....ESTABLISH V_X
 Landing Gear (Out of Usable Runway).....UP
 FlapsRETRACT SLOWLY
 Go-Around Checklist.....COMPLETE

V/R	AFTER LANDING
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Throttle.....IDLE
 Flaps.....UP
 Mixture.....LEAN
 Fuel Pump.....OFF
 External Lights.....AS REQUIRED
 Pitot Heat.....OFF
 Transponder.....VERIFY STDBY
 Time On.....NOTE
 Taxi Route.....OBTAIN/VERIFY
 After Landing Checklist.....COMPLETE

V/R	PARKING AND SECURING
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Parking Brake.....SET
 GPS.....OFF
 Throttle.....IDLE
 Avionics Master.....OFF
 Magnetos.....GROUND CHECK
 Mixture.....IDLE CUT-OFF
 Magnetos.....OFF
 ALT/BAT Master Switches.....OFF
 Lights/Electrical Switches.....OFF
 Parking Brake.....RELEASED
 Hobbs/Tachometer Times.....RECORDED
 Window/Door.....SECURED
 Tie Downs.....SECURED
 Post-Flight Inspection.....COMPLETE
 Parking & Securing Checklist.....COMPLETE

Expanded Normal Procedures

V/R	AIRCRAFT ACCEPTANCE
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Aircraft Surfaces.....CLEAR

- ✦ Ensure that all flight control and wing surfaces are clear and free of any debris, frost, ice, or snow.

Windows/Windscreen.....CLEAN/NO DAMAGE

- ✦ Clean windows and windscreen as necessary with approved cleaning solution and cloth.

Maintenance Status.....VERIFIED/CLEARED

- ✦ Verify aircraft maintenance and avionics/navigation inspection dates/times have not been exceeded, and documents are properly completed and present in the aircraft “can.”

Hobbs Meter.....RECORDED

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

Tachometer Time.....RECORDED

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

Carbon Monoxide Detector.....CHECKED

- ✦ Check CO indicator, verify operable/safe status.

Fire Extinguisher.....CHARGED/SECURED

- ✦ Check that fire extinguisher is aboard, fully charged, safety pin is secured, and unit is securely stowed.

Aircraft Documents.....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, and additional appropriate operations manuals (e.g. GPS) are aboard. Verify flight crew possesses appropriate photo identification, current pilot and medical certificates.

Aircraft Cabin Area.....CLEAN/NO DAMAGE

- ✦ Verify condition of cabin. Remove any items left by previous crew. After flight event, contact previous crew regarding proper removal/disposal of items, if applicable.

A/C Acceptance Checklist.....COMPLETE

- ✦ Verify the Aircraft Acceptance checklist has been completed.

N/R	PRE-FLIGHT INSPECTION
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The preflight inspection is a visual check to verify that the airplane and all its visible components and equipment are safe and ready to fly. 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.” The preflight inspection is conducted prior to the first flight of the day and at Pilot-in-Command changes. “B” checklist items must be completed between Pilot-In-Command changes. A walk-around will be conducted during turnarounds in accordance with the Preflight Inspection checklist. *The walk-around shall be conducted with the checklist in-hand.*

- Flight Controls.....FREE/CORRECT
 - ⊕ Release the seatbelt securing the control yoke. Verify freedom and correct movement/displacement of all flight controls.

- ^BParking Brake.....SET
 - ⊕ Set parking brake ON.

- ^BIgnition Switch.....OFF
 - ⊕ Verify ignition switch is in the OFF position, and key is out of ignition.

WARNING

If the ignition switch is not in the OFF position or the key can be removed from the ignition housing while remaining in the Left, Right or Both magneto “ON” position, the flight crew will immediately report this to BSC Dispatch for maintenance action.

- ^BBattery Master Switch.....OFF
 - ⊕ Verify Battery master switch is in the OFF position.

- Avionics Master Switch.....OFF
 - ⊕ Verify Avionics master switch is in the OFF position.

- Pitot/Static System.....DRAIN
 - ⊕ Push and hold drain buttons for approximately 3 seconds each. Drain buttons are located at the base of the cabin wall, left of the pilot’s seat.

- ELT.....ARMED
 - ⊕ Verify that ELT is armed but not transmitting. If the ELT is transmitting, attempt to turn it off via the remote switch in the cockpit. Report the activation to BSC Dispatch.

Fuel Selector.....CHECKED/SET

- ⊕ Verify that the fuel selector can be moved freely between OFF, Left, and Right tank positions. Set the fuel selector to the lowest tank.

Gear Handle.....DOWN

- ⊕ Verify landing gear handle is in the DOWN position. If the handle is in the UP position, report the discrepancy immediately to BSC Dispatch.

Mixture.....IDLE CUT-OFF

- ⊕ Verify mixture control is in the full aft IDLE CUT-OFF position.

Avionics Master Switch.....OFF

- ⊕ Verify avionics master switch is in the OFF position.

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.

All Electrical Switches.....OFF

- ⊕ Verify all remaining electrical switches are in the OFF position.

^BBattery Master Switch.....ON

- ⊕ Place battery master switch in the ON position.

^BLanding Gear Lights.....ALL ON

- ⊕ Verify all three (3) landing gear lights are illuminated and in the correct bulb position (e.g. Left Main bulb is in the lower left bulb socket). If any bulb fails to illuminate, trouble shoot by switching bulbs to test bulb/socket operation. If issue is not resolved, contact Dispatch for Maintenance assistance.

Fuel Gauges.....CHECKED

- ⊕ Check fuel gauges to confirm operation.

NOTE

Fuel gauge readings cannot be used to accurately determine usable fuel load. Flight crews shall also manually check fuel levels in each tank in accordance with the pre-flight checklist.

Annunciator Lights.....TEST

- ⊕ Verify operation of all caution/warning lights.

^BCockpit/Exterior LightsCHECKED

- ⊕ Test and verify operation of all cockpit and exterior lighting.

Stall Warning Vane.....CHECKED

- ⊕ Check stall warning vane and horn for proper operation.

Pitot Heat.....CHECKED

- ⊕ Turn pitot heat ON, and verify pitot mast is heating properly. Turn pitot heat switch OFF.

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.

Comm/Nav Radios.....CHECKED

- ⊕ Test GPS communication and navigation radio(s) as follows: Verify GPS card is current. Verify communication radio(s) clearly receiving on local ATIS, Ground, or other frequency, as appropriate and are NOT set on 121.5 Mhz. Test transmit capability by clicking the transmit key on the control yoke two (2) times. Verify navigation radio(s) are receiving properly by selecting a local navaid frequency, identifying the signal via Morse code ID, and ensuring CDI indications on instrument faces accurately reflect position of aircraft relative to navigation signal.

GPS.....OFF

- ⊕ Switch the GPS unit OFF and ensure unit is fully shut down.

Avionics Master Switch.....OFF

- ⊕ Place the avionics master switch in the OFF position.

^BBattery Master Switch.....OFF

- ⊕ Place the battery master switch in the OFF position.

Circuit Breakers.....CHECKED/IN

- ⊕ Verify all circuit breakers are checked, are in, and that any circuit breakers that are disengaged are properly placarded and collared, if applicable.

^BFlaps.....DOWN

- ⊕ Retract flap handle fully upward and verify flaps are fully extended.

RIGHT WING

Flap, Aileron, Hinges.....CHECKED

- ⊕ Check flap, aileron, and all hinge points for connections and free movement, verify all are secure and undamaged (e.g. dents, binding).

Static Wicks.....CHECKED

- ⊕ Verify static wicks are attached and secure.

^BWing Tip/Lights.....CHECKED

- ⊕ Verify wingtip is secure and undamaged. Verify strobe and navigation lights are operative and secure.

Wing Leading Edge.....CHECKED

- ⊕ Check leading edge for dents or other damage.

Wing Inspection Plates.....SECURE

- ⊕ Verify all inspection plates are in place and secured.

^BFuel Tank Vent.....UNOBSTRUCTED

- ⊕ Inspect fuel vent opening and ensure it is unobstructed by any foreign matter/debris.

^BTie Down.....REMOVED/STOWED

- ⊕ Detach and securely stow the tie-down strap inside the aircraft.

Fuel Tank Sump.....DRAIN

- ⊕ Remove a sample of fuel and inspect for contaminants. Return clean fuel to fuel tank when inspecting fuel level and cap.

^BLanding Gear, Main.....CHECKED

- ⊕ Inspect landing gear assembly. Verify proper oleo extension (2.0" +/- .25"), components (actuator, side brace, torque link, springs, down-limit hooks and tabs) and hub assembly are secure. Verify web plate bolts (front and rear) are secure. Check strut housing for cracks. Verify up- and down – limit tabs are free of debris and contaminants. Check that all connections (bolts, nuts, cotter pins) are secure on gear assembly. Check tire tread wear, and move aircraft if necessary to view entire tire. Verify air valve cap is in place. Check brake lines and brake assembly and ensure attachments are secure. Check connecting points for hydraulic fluid leaks. Check brake pads for wear (approximately 1/16" or the thickness of a nickel is minimum allowable thickness for operation).

NOTE

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

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

Fresh Air Inlet.....UNOBSTRUCTED
 ⚙ Verify that wing root fresh air inlet is free of debris or contaminants.

^BFuel Level and Cap.....CHECKED/SECURE
 ⚙ Remove fuel cap and replace fuel from tester. Secure fuel cap. Inspect wing upper surface for contaminants and/or damage.

NOSE

^BEngine Oil Level.....CHECKED
 ⚙ Verify oil level is at least 5 quarts, 6 for extended flights. Do not overfill.

^BOil Level/Dipstick.....CHECKED/SECURE
 ⚙ Replace oil dipstick in socket, verify it is secure.

Oil Door.....CLOSED/SECURE
 ⚙ Secure oil door. Take care not to scratch or damage engine cowling with foreign objects (e.g. wristwatch, fuel tester)

Cowling.....NO DAMAGE/SECURE
 ⚙ Inspect engine cowling for damage and attachment. Verify latches are secured and upper cowling is properly attached to lower cowling.

^BCowl Intakes.....UNOBSTRUCTED
 ⚙ Check cowl intakes and under cowl to ensure they are free of foreign matter (e.g. leaves, small animals).

Engine Baffles.....SECURE/NO DAMAGE
 ⚙ Inspect engine baffles through the forward cowl openings. Ensure there is no damage or foreign objects inside cowl.

Alternator/Belt.....CHECKED
 ⚙ Verify alternator belt and alternator are secure. Verify belt shows no damage (fraying, uneven wear, gouges).

Propeller and Spinner.....CHECKED

- ✚ Inspect propeller face and back for damage or fluid leaks. Propeller should be free of knicks, cracks, or spurs. Verify that spinner has no damage and is secure.

^BLanding Light.....CHECKED

- ✚ Verify landing light is secure and operational.

^BLanding Gear, Nose.....CHECKED

- ✚ Inspect landing gear assembly. Verify proper oleo extension (2.75" +/- .25"), components (actuator, side brace, drag link, springs, down-limit hooks and tabs) and hub assembly are secure. Verify attachment bolts are secure. Check strut housing for cracks. Verify up- and down – limit tabs are free of debris and contaminants. Check that all connections (bolts, nuts, cotter pins) are secure on gear assembly. Check tire tread wear, and move aircraft if necessary to view entire tire. Verify air valve cap is in place.

NOTE

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

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

Intake Hoses.....CHECKED

- ✚ Inspect rear of nose gear wheel-well to verify cabin air intake hoses are attached and secure.

Fuel Strainer.....DRAIN

- ✚ Remove a sample of fuel and inspect for contaminants. Return clean fuel to left fuel tank when inspecting fuel level and cap.

LEFT WING

Fresh Air Inlet.....UNOBSTRUCTED

- ✚ Verify that wing root fresh air inlet is free of debris or contaminants.

B.G.E. Mast (If Installed).....CHECKED

- ✚ Verify that back-up gear extender mast inlet (if installed) is free of debris or contaminants.

- ^BLanding Gear, Main.....CHECKED
- ⊕ Inspect landing gear assembly. Verify proper oleo extension (2.0" +/- .25"), components (actuator, side brace, torque link, springs, down-limit hooks and tabs, and hub assembly) are secure. Verify web plate bolts (front and rear) are secure. Check strut housing for cracks. Verify up- and down – limit tabs are free of debris and contaminants. Check that all connections (bolts, nuts, cotter pins) are secure on gear assembly. Check tire tread wear, and move aircraft if necessary to view entire tire. Verify air valve cap is in place. Check brake lines and brake assembly and ensure attachments are secure. Check connecting points for hydraulic fluid leaks. Check brake pads for wear (approximately 1/16" or the thickness of a nickel is minimum allowable thickness for operation).

NOTE

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

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

- Fuel Tank Sump.....DRAIN
- ⊕ Remove a sample of fuel and inspect for contaminants. Return clean fuel to fuel tank when inspecting fuel level and cap.

- Wing Inspection Plates.....SECURE
- ⊕ Verify all inspection plates are in place and secured.

- ^BTie Down.....REMOVED/STOWED
- ⊕ Detach and securely stow the tie-down strap inside the aircraft.

- ^BFuel Tank Vent.....UNOBSTRUCTED
- ⊕ Inspect fuel vent opening and ensure it is unobstructed by any foreign matter/debris.

- ^BFuel Level and Cap.....CHECKED/SECURE
- ⊕ Remove fuel cap and replace fuel from tester. Secure fuel cap. Inspect wing upper surface for contaminants and/or damage.

- Wing Leading Edge.....CHECKED
- ⊕ Check leading edge for dents or other damage.

- ^BWing Tip/Lights.....CHECKED
- ⊕ Verify wingtip is secure and undamaged. Verify strobe and navigation lights are operative and secure.

Static Wicks.....CHECKED

- ⊕ Verify static wicks are attached and secure.

Aileron, Flap, Hinges.....CHECKED

- ⊕ Check flap, aileron, and all hinge points for connections and free movement, verify all are secure and undamaged (e.g. dents, binding).

FUSELAGE, LEFT

Air Inlets.....CHECKED

- ⊕ Verify air inlets are undamaged and free of foreign objects/debris.

Antennas.....SECURE/NO DAMAGE

- ⊕ Verify communications and navigation antennas are secure and undamaged.

Empennage.....CHECKED

- ⊕ Check fuselage skin for damage.

^BStabilator/Servo Tab.....CHECKED

- ⊕ Check left stabilator and anti-servo tab for freedom/correct movement and any damage.

^BRudder.....CHECKED

- ⊕ Check rudder attachment points and cable connections. Verify rudder is undamaged.

^BTie Down.....REMOVED/STOWED

- ⊕ Detach and securely stow the tie-down strap inside the aircraft.

FUSELAGE, RIGHT

^BStabilator/Servo Tab.....CHECKED

- ⊕ Check right stabilator and anti-servo tab for freedom/correct movement and any damage.

Battery Box Vents/Drains..... CHECKED/UNOBSTRUCTED

- ⊕ Verify battery box vents and drains are clear and free of any obstructions.

External Power Receptacle.....SECURE

- ⊕ Verify receptacle area is clear of foreign matter and cover operates freely.

Landing Gear Pump.....CHECKED

- ⊕ Remove rear baggage wall/access panel carefully. Inspect landing gear pump for any leaks or other damage.

Baggage Area (Tow Bar if Installed).....SECURE

- ⊕ Verify tow bar (if installed) and any loose items are secured in the baggage area.

^BBaggage Door.....CHECKED/SECURE
 ⊕ Verify baggage area door is closed, latched, and secure.

^BPre-Flight Inspection Checklist.....COMPLETE
 ⊕ Verify Pre-Flight Inspection checklist has been completed.

C/R	BEFORE ENGINE START
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Aircraft Acceptance Check.....COMPLETE
 ⊕ Verify Aircraft Acceptance check has been completed.

Pre-Flight Inspection.....COMPLETE
 ⊕ Verify Pre-Flight Inspection checklist has been completed.

Passenger Briefing.....COMPLETE
 ⊕ Brief all occupants on the location of all emergency exits, use of seat belts and harnesses, and emergency procedures in the event of an engine fire during engine start. Brief flight crew procedure for positive exchange of flight controls during ground and flight operations.

Seats/Belts/Harnesses.....CHECKED/LATCHED
 ⊕ Fasten seat belts/shoulder harnesses. Adjust seat to ensure full rudder travel and brake control from the desired seating position. Verify seat remains in position when maximum pressure is applied to the brakes. Brief all occupants on the use of seat belts and shoulder harnesses, and verify that all passengers are properly secured.

Flaps.....UP
 ⊕ Lower the flap handle and retract flaps to the UP position. Verify flaps retract smoothly and fully.

Parking Brake.....SET
 ⊕ Set parking brake by pulling back on the brake handle to its full up/aft position, and then depressing the button. The brake handle should remain in the set position.

Avionics Master.....OFF
 ⊕ Verify avionics master switch is OFF.

Circuit Breakers.....CHECKED/IN
 ⊕ Verify all circuit breakers are in or collared and placarded, if applicable.

Alternate Air.....CLOSED
 ⊕ Set alternate air knob to the closed position.

Propeller.....FULL INCREASE

- ⊕ Set propeller control full forward to the full increase position.

Fuel SelectorLOWEST TANK

- ⊕ Set fuel selector to the tank containing the least fuel. This will ensure the tanks are switched (during the Before Takeoff check) to the fullest tank for takeoff and departure, and that both tanks are providing adequate fuel to the power plant.

Before Engine Start Checklist.....COMPLETE

- ⊕ Verify Before Engine Start checklist has been completed.

C/R	ENGINE START
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Battery MasterON

- ⊕ Turn battery master switch to ON position.

Alternator Switch.....ON

- ⊕ Place the alternator switch to the ON position.

External Lights.....AS REQUIRED

- ⊕ At minimum, ensure beacon is turned on. If beacon is not installed on the aircraft, turn on navigation lights. As necessary, turn on additional external lighting.

CAUTION

Flight crews are reminded to exercise good judgment and professional courtesy when using of aircraft lighting, especially during night or low-visibility options in the vicinity of other personnel, aircraft, or vehicles.

(NORMAL)

Throttle.....OPEN 1/2 INCH

- ⊕ Push throttle approximately 1/2" forward.

Fuel Pump.....ON

- ⊕ Place the fuel pump switch in the ON position. This will give the pump enough time to supply adequate fuel for engine start, without running it unnecessarily for an extended period. If the engine does not start or starts with difficulty, disengage the starter and re-prime as necessary.

CAUTION

Do not allow the fuel pump to continue running if the engine start sequence will be discontinued and re-attempted. Reset for another start attempt and perform the procedure as indicated in the Flight Standards Manual.

- Mixture.....RICH, NOTE FF, IDLE CUT-OFF
 ⊕ Push mixture control full forward, note positive fuel flow on the fuel flow meter, then retract mixture control to the cut-off position to avoid a flooded engine during start.
- Propeller Area.....VERIFY L/C/R CLEAR
 ⊕ Verify area to the left, center, right, and behind the aircraft is clear of any personnel or equipment. Call out clearly and loudly “CLEAR PROP!” before engaging starter.
- Starter.....ENGAGE
 ⊕ Insert key and engage starter. After engine catches and start is successful, release starter to “BOTH” position on the ignition switch.
- Mixture.....FULL FORWARD
 ⊕ Once engine turns over, smoothly and quickly advance the mixture control to the full forward position.
- Throttle.....800-1000 RPM
 ⊕ Set throttle to 800-1000 RPM for engine warm-up.
- Oil Pressure.....CHECKED
 ⊕ Check oil pressure and ensure it is within normal operating limits, 60-90 PSI. For cold weather operation, allow the engine to warm until oil pressure reading begins to increase to normal range (typically not less than 60 – 90 seconds).

(HOT START)

- Throttle.....OPEN 1/2 INCH
 ⊕ Push throttle approximately 1/2” forward.
- Fuel Pump.....ON
 ⊕ Place the fuel pump switch in the ON position.
- Mixture.....IDLE CUT-OFF
 ⊕ Retract to the cut-off position to avoid a flooded engine during start.
- Propeller Area.....VERIFY L/C/R CLEAR
 ⊕ Verify area to the left, center, right, and behind the aircraft is clear of any personnel or equipment. Call out clearly and loudly “CLEAR PROP!” before engaging starter.

- Starter.....ENGAGE
 ⊕ Insert key and engage starter.
- Mixture.....FULL FORWARD
 ⊕ Once engine turns over, smoothly and quickly advance the mixture control to the full forward position.
- Throttle.....800-1000 RPM
 ⊕ Set throttle to 800-1000 RPM for engine warm-up.
- Oil Pressure.....CHECKED
 ⊕ Check oil pressure and ensure it is within normal operating limits, 60-90 PSI. For cold weather operation, allow the engine to warm until oil pressure reading begins to increase to normal range (typically not less than 60 – 90 seconds).
- **COMPLETE FOR ALL STARTS****
- Avionics Master.....ON
 ⊕ Place avionics switch in the ON position.
- Fuel Pump.....OFF
 ⊕ Switch fuel pump to the OFF position.
- Mixture.....LEAN
 ⊕ Lean the mixture as appropriate to the ground operating conditions.
- Engine Instruments.....CHECK
 ⊕ Check engine tachometer, oil pressure, oil temperature, and EGT to ensure engine is operating within normal limitations.
- Engine Start Checklist.....COMPLETE
 ⊕ Verify Engine Start checklist has been completed.

C/R	TAXI
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The Pilot-In-Command **MUST** ensure that the flight crew maintains visual avoidance for other aircraft, personnel, vehicles, and objects at all times, especially during taxi operations in and around the parking ramp. Flight crews shall avoid head-down time (e.g. making changes to avionics settings, reading lesson plans) and avoid exchanges of flight controls or brakes and steering checks until *well* clear of other parked aircraft, vehicles, or structures.

CAUTION

Proper taxi speeds play a significant role in collision avoidance. The PIC is responsible for ensuring the aircraft taxis at a speed consistent with safety. Always be attentive to taxi speed, and when in doubt, SLOW DOWN.

Avionics.....SET AS REQUIRED

- ⊕ Set #1 navigation radio for primary navigation, and in-flight frequencies. Set radio #2 for back-up navigation and ground frequencies.

Transponder.....VERIFY STDBY

- ⊕ Set transponder to VFR if conducting VFR operations. For IFR operations, set transponder code in accordance with the IFR clearance, as received by ATC.

External Lights.....AS REQUIRED

- ⊕ Set external lights as appropriate for the conditions.

Taxi Area.....VERIFY L/C/R CLEAR

- ⊕ Verify the taxi area is clear to the left, forward (center) and right of the aircraft in preparation for taxi.

Parking Brake.....RELEASE

- ⊕ Release the parking brake by pulling back on the handle without depressing the button. Release the handle to the full down position.

Brakes and Steering.....CHECKED

- ⊕ Verify brakes are operational during initial movement out of parking space. Verify left and right steering is operational during taxi.

Flight Instruments.....CHECKED

- ⊕ Check flight instruments during taxi to ensure proper operation.

Taxi Checklist.....COMPLETE

- ⊕ Verify the Taxi Checklist has been completed.

C/R

BEFORE TAKEOFF

Heading.....INTO WIND

- ⊕ Point nose of the aircraft into the wind to aid in engine cooling during run-up. To the degree possible, avoid directing prop wash toward personnel, other aircraft, hangars, etc.

Parking Brake.....SET

- ⊕ Set the parking brake as previously described in this chapter.

Fuel Selector.....SWITCH TANKS

- ⊕ Switch fuel selector to the fullest tank. Note time. Tanks can typically be switched every 30 minutes to ensure weight balance and enhance crew awareness of fuel status during the flight.

Fuel Quantity.....VERIFY

- ⊕ 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.

Cabin Heat/Defrost.....AS REQUIRED

- ⊕ Set cabin heat/defrost as required for conditions. Allow warm-up time as appropriate for the weather conditions and crew/passenger comfort.

Flight Controls.....FREE/CORRECT

- ⊕ Verify flight controls are free and correct through entire range of movement. Pilot should request assistance from front-seat passenger or instructor to view and verify proper movement of stabilator, anti-servo-tabs, and rudder.

Brakes.....HOLD

- ⊕ Verify that the pilot/flight crew has their feet on the brake toe pedals and the aircraft is secured against forward movement.

RUN-UP CHECK

Mixture.....RICH

- ⊕ Verify mixture is full forward.

Throttle.....2000 RPM

- ⊕ Advance throttle to indicate 2000 RPM on the tachometer.

Propeller.....EXERCISE

- ⊕ Smoothly cycle the propeller control three (3) times from high (2000 RPM) to low (1700 – 1800 RPM), then back to high (2000 RPM) and check the following:
 - a. RPM decreases, then increases
 - b. Manifold pressure increases, then decreases
 - c. Oil pressure decreases, then increases
 - d. The aircraft shows no indication of oil leakage on the nose cowling or windscreen

NOTE

Do not allow greater than 500 RPM decrease during the propeller exercise sequence.

Alternate Air.....CHECKED

- ⊕ Move the alternate air control lever to the OPEN position and check for a change in RPM. Any significant RPM change may indicate a blockage in the main air induction system, and the aircraft should be returned to the ramp for a maintenance action. Return the alternate air control level to the CLOSED position.

Suction Gauge.....4.9 – 5.1 Hg

- ⊕ Verify vacuum pump is producing 4.9 – 5.1 Hg. If pressure is low, verify RPM setting is correct. If no change, there may be a leak in the line or blockage within the system. Higher than normal reading may indicate an improper setting on the system. Return aircraft for maintenance if pressure remains outside normal limits.

Caution/Warning Lights.....CHECKED

- ⊕ Verify normal operation of caution/warning lights.

Magnetos.....CHECKED

- ⊕ Turn ignition key to the Right magneto, verify RPM drop not more than 175 RPM. Return key to BOTH position and allow RPMs to stabilize. Repeat for the Left magneto and note RPM drop. Verify not more than 50 RPM difference between Right and Left magneto indications. Verify ignition is returned to BOTH position.

NOTE

If RPM drop exceeds specified limits (Max. 175 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 action.

Ammeter.....CHECKED

- ⊕ Check ammeter for correct output level, test by switching landing light on, then off, and noting ammeter indication. DO NOT switch alternator off to check ammeter, as turning the alternator back on could cause an electrical spike and damage avionics equipment.

Engine Instruments.....CHECKED

- ⊕ Verify all engine instruments are reading in their normal range. Oil pressure 60-90 psi, oil temperature 75 – 245° F, RPM 2000 and holding.

Throttle.....IDLE

- ⊕ Retard throttle to IDLE.

Mixture.....LEAN

- ⊕ Lean the mixture as appropriate for ground operating conditions.

AFTER RUN-UP CHECK

Quadrant Friction.....SET

- ⊕ Adjust quadrant friction lever (right side of throttle quadrant) to allow free but controlled movement of the throttle, propeller, and mixture controls.

Aux. Vacuum (If Installed).....CHECKED

- ⊕ If it is installed on the aircraft, place the auxiliary vacuum switch in the ON position – note an increase in the vacuum pressure and a spike on the ammeter. Return the switch to the OFF position.

Flight Instruments.....SET

- ✦ Verify magnetic compass case is full of fluid, card is floating freely, and compass deviation card is legible. Verify clock is operating properly and set to the correct time. Verify ASI indicates zero. Set attitude indicator (AI) for straight and level flight; verify horizon is level and shows no more than 5° bank during taxi turns. Set altimeter to the current local altimeter setting and verify within 75’ of the local field elevation. Verify the turn coordinator shows wings level, no flag, and the inclinometer (ball) centered. Set heading indicator to the magnetic compass. Note any variations from zero on vertical speed indicator (VSI). Set localizer frequency for departure airport (if available) and front course on OBS 1. Use OBS 2 for positional awareness using nearest VOR, or course to nearest GPS waypoint, as appropriate.

Navigation Radios/GPS.....SET TAKEOFF

- ✦ Set GPS 1 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 GPS 1 (cross fill into GPS 2, if installed).

Trim.....SET TAKEOFF

- ✦ Set trim for takeoff using the manual trim wheel located between the pilot and co-pilot seats. Takeoff trim setting can be established using the indicator on the trim wheel housing.

Departure Briefing.....COMPLETE

- ✦ The PF shall conduct the departure briefing which will include but not be limited to the following:

1. Who will conduct the takeoff, and type of takeoff.
2. Aircraft flap configuration and V_R speed(s).
3. “Bridgewater Standard” departure, per the following example:

Bridgewater Standard departure - Any abnormalities before V_R, call the malfunction and abort the takeoff. Call “ABORT” and execute the appropriate checklist. In the unlikely event of an engine failure after takeoff, maintain aircraft control and conduct the appropriate Engine Failure During Takeoff checklist. Any problems after V_R and below 1000’, call the malfunction, maintain aircraft control, establish best glide for gear/flaps up or down as appropriate, and execute the Engine Failure in Flight emergency checklist. Above 1000’, call the malfunction and execute the Engine Failure During Flight checklist and any subsequent checklists, as appropriate.

4. Initial altitude and route.
5. Review three-way positive exchange of the flight controls.

6. Sterile cockpit requirements below 1000' AGL.
7. Brief the passengers, if applicable.

Sample Departure Briefing

“I will conduct a short-field takeoff, flaps 25⁰, V_R is 55 KIAS. Bridgewater Standard, runway heading to 1000' AGL before turning north to Practice Area Charlie. We will execute positive three-way exchanges of flight controls during all ground and flight operations. I am the acting PIC for this flight. In the event of a real urgency or emergency condition, the lesson is terminated and we will handle the situation as a team using crew coordination procedures. Sterile cockpit is in effect during the landing phase unless it is instructionally necessary. Do all passengers have their seat belts on and understand how to egress the aircraft? Any questions?”

- Taxi Route.....OBTAIN/VERIFY
- ⊕ Obtain taxi instructions (assumes controlled airport) or indicate intended taxi route (non-controlled airport). Verify taxi route using current taxi diagram for the airport of operation. Ensure that both flight crew members are clear and in agreement of the required route, including any possible high-risk areas.
- Parking Brake.....RELEASED
- ⊕ Release the parking brake by pulling back on the handle without depressing the button. Release the handle to the full down position. Initiate the taxi.
- Before Takeoff Checklist.....COMPLETE
- ⊕ Verify the Before Takeoff checklist has been completed.

V/R **LINE-UP**

- TrimSET/CHECKED
- ⊕ Verify trim is set for takeoff.
- Flaps.....SET/CHECKED
- ⊕ Set flaps as appropriate for the takeoff being conducted. Visually verify flap setting and symmetry.
- Air Conditioning (If Installed).....OFF
- ⊕ Place air conditioning control switch in the OFF position.
- Alternate Air.....CLOSED
- ⊕ Verify the alternate air lever is in the closed position.

Propeller.....FULL INCREASE

- ⊕ Verify the propeller control lever is full forward to the full increase position.

Fuel Pump.....ON

- ⊕ Place the fuel pump switch in the ON position.

Flight Instruments.....CHECKED

- ⊕ Verify flight instruments are set for takeoff. Re-align heading indicator with magnetic compass if necessary.

Engine Instruments.....CHECKED

- ⊕ Verify all engine instruments (fuel quantity indicators, manifold pressure, fuel flow/pressure, ammeter, oil pressure, and oil temperature gauges) are showing normal indications.

Heading.....SET TAKEOFF RWY

- ⊕ Verify the assigned takeoff runway and verbalize required takeoff heading.

Fuel Selector.....FULLEST TANK

- ⊕ Verify fuel selector is placed on fullest tank. Flight crews should not switch tanks at this time unless there is ample time before takeoff to verify that fuel is being adequately supplied from the new tank.

CAUTION

During ground tests of the PA-28R-200 Arrow fuel system, it was determined that with the engine running at idle power, a period of approximately 30 – 45 seconds passed between the moment the fuel selector was placed in the OFF position, and when the engine lost power due to fuel exhaustion. Flight crews are cautioned against switching fuel tanks immediately prior to conducting any takeoff.

Door.....CLOSED/LATCHED

- ⊕ Verify co-pilot/passenger door is closed and latched. Secure the side latch first, followed by the top latch. If both latches cannot be secured, return the aircraft to the ramp for maintenance action.

AFTER CLEARED ON TO RUNWAY

Flight crews are reminded that they should NOT request a takeoff clearance until they are prepared to execute the clearance promptly when it is received. Flight instruction should be kept to a minimum or, better yet, avoided after the clearance is received as the aircraft taxis into position for takeoff. This will help to avoid distractions and associated errors, and minimize time taxiing onto the runway.

- Time Off.....NOTE
 ⚙ Note time off. Time permitting, make notation on kneeboard.
- Mixture.....FULL RICH
 ⚙ Set mixture to full rich.
- External Lights.....AS REQUIRED
 ⚙ Set anti-collision/strobes, landing light, and navigation lights (if installed) to ON.
- Transponder.....ON/ALT
 ⚙ Set transponder to ALT.
- RWY Alignment.....SET/VERIFY
 ⚙ Establish the aircraft on departure runway centerline and verify that the compass and heading indicator show the correct takeoff heading.
- Line-Up Checklist.....COMPLETE
 ⚙ Verify the Line-Up checklist has been completed.

V/R	CLIMB
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This checklist should be completed after the aircraft is safely established in a climb, reconfigured for the departure and above 1000’ AGL. Flight crews may initiate the checklist sequence so as to complete it upon reaching or climbing through 1000’ AGL.

- ^RFlaps.....UP
 ⚙ After the aircraft has established a positive rate of climb and is clear of any obstacles in the departure path, smoothly and incrementally lower the flap handle as required, and verify flaps are up.
- ^RLanding Gear.....UP
 ⚙ After the aircraft has established a positive rate of climb and beyond any usable remaining runway, smoothly pull the landing gear handle outward and upward, placing it in the UP position and releasing it. Verify landing gear is properly in transit by observing and verbalizing illumination of the gear warning/transit lights, as appropriate. Verify the gear has fully retracted and is stowed by noting the extinguishing of the three (3) green landing gear lights, and of the gear warning/transit lights, and calling “Gear up and stowed.”
- ^RClimb Power.....SET
 ⚙ Verify throttle is set to FULL and the engine is developing full power. After reaching desired altitude but not before passing 1000’ AGL, reduce power to 25” manifold pressure, decrease propeller RPM to 2500, and set climb airspeed as required.

Mixture.....FULL RICH

- ⊕ Verify mixture is set to full rich.

Fuel Pump (1000' AGL or Above)OFF

- ⊕ Climbing through 1000' AGL, switch the fuel pump switch to OFF. Verify fuel pressure is being maintained within normal limits. The fuel pump should remain on for repetitive landing operations.

^REngine Instruments.....CHECKED

- ⊕ Verify all engine instruments are indicating normal operation.

^RTransponder.....VERIFY ALT

- ⊕ Verify transponder has switched to ALT mode and correct squawk code is set into the unit.

Climb Checklist.....COMPLETE

- ⊕ Verify the Climb checklist has been completed.

V/R	CRUISE
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Cruise Power.....SET

- ⊕ Set throttle and propeller controls to achieve desired cruise power setting. When decreasing power, reduce throttle first, then propeller RPM. When increasing power, increase propeller RPM first, then increase throttle setting.

Mixture.....LEAN AS REQUIRED

- ⊕ Lean mixture to obtain best fuel flow for segment to be flown. Reference fuel flow gage and exhaust gas temperature gage, adjust as appropriate.

Engine Instruments.....CHECK

- ⊕ Verify all engine instruments are indicating normal operation.

Trim.....AS REQUIRED

- ⊕ Set trim for “hands off” flying, as appropriate to the prevailing weather conditions.

Heading Indicator/Compass.....CHECK

- ⊕ Crosscheck heading indicator to magnetic compass and verify that heading indicator accurately reflects compass reading. Under turbulent conditions or flight segments involving repetitive maneuvering, flight crews should make this check more frequently.

External Lights.....AS REQUIRED

- ⊕ Set external lights as required. Flight crews are encouraged to utilize maximum available lighting to increase their aircraft’s visibility to other traffic.

Cruise Checklist.....COMPLETE
 ☒ Verify the Cruise checklist has been completed.

V/R	DESCENT
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This checklist will be completed prior to beginning the initial descent for arrival. Flight crews are reminded to adjust the aircraft altimeter to the local altimeter setting.

Seats/Seatbelts/Harnesses.....CHECKED
 ☒ Ensure flight crew and passenger (if applicable) seats are in proper position and locked. Verify all aircraft occupant seatbelts and harnesses are properly latched and secured.

Mixture.....ADJUST W/DESCENT
 ☒ Adjust mixture as aircraft descends to account for changes in air density.

Gear Warning Horn.....CHECKED
 ☒ Retard throttle with flaps UP to 14” manifold pressure or as required to trigger the gear warning light and horn. Verify visual/audible warning indications as specified in Chapter 3 of this manual. Set throttle as required for descent.

Throttle.....AS REQUIRED
 ☒ Set throttle as required for the desired descent rate/airspeed.

Descent Checklist.....COMPLETE
 ☒ Verify the Descent checklist has been completed.

C/R	APPROACH
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NOTE

This checklist shall be completed prior to each landing, regardless of whether the aircraft is arriving from outside the airport environment or conducting repetitive landing operations. For repetitive landing operations, conduct the checklist once the aircraft is established in the downwind leg of the traffic pattern.

^RApproach Briefing.....COMPLETE
 ☒ Conduct the approach briefing appropriate to the type of arrival (from cruise vs. repetitive pattern operations). Follow the example provided at the end of this section.

Fuel Selector.....BOTH
 ☒ Verify the fuel selector is set to the LEFT or RIGHT tank, as appropriate.

External Lights.....AS REQUIRED

- ⊕ Verify external lights are turned on in accordance with prevailing weather conditions and visibility requirements. As a rule, flight crews should use maximum lighting for their aircraft when it is available, especially in higher-traffic environments. At minimum, the rotating/flashing beacon and landing light will be turned on.

Parking Brake.....VERIFY RELEASED

- ⊕ Verify the parking brake is not engaged, and that the brakes are generating appropriate pressure (both pilot stations).

^RApproach Checklist.....COMPLETE

- ⊕ Verify the Approach checklist has been completed.

Approach Brief

Complete the Approach checklist not later than five (5) miles from the airport of intended landing or, for repetitive traffic pattern operations, after the aircraft is established on the downwind leg. During instructional flights the pilot flying will conduct the Approach Brief. For non-instructional flights, the pilot flying may transfer the flight controls or continue flying, at his/her discretion.

- ⊕ For repetitive traffic pattern operations, the briefing will contain:
 - The type of landing to be conducted, the landing runway, intended touchdown point, and how the landing will terminate (stop and go, full stop, etc.).
- ⊕ For VFR arrivals from outside the traffic pattern, the briefing will contain the following:
 - The arrival runway, direction of traffic, point of intended landing, and which electronic backup will be used for the approach, if one is available. The brief may include any additional information deemed necessary by the PIC.

NOTE

Flight crews are strongly encouraged to use all available navigational aids, including during VFR conditions, to enhance situational awareness and ensure arrival at the correct airport on the correct runway. **FLY ASSERTIVELY - AVOID COMPLACENCY!**

- ⊕ For IFR weather conditions, or for IFR training in VFR weather, the briefing will contain:
 - Name of the instrument approach
 - Communication and navigation frequencies and identifiers
 - Inbound final approach course
 - Altitudes during the approach (e.g. procedure turn, initial, step downs, DA/DH/MDA, field elevation, or as appropriate). Note TDZE.
 - Verification of required navigational signal or GPS receiver status
 - Missed approach procedure (missed approach point, initial course or heading, holding fix)
 - Any other information the PIC deems necessary

C/R

BEFORE LANDING

THIS CHECKLIST SHALL BE COMPLETED PRIOR TO EACH LANDING.

^RLanding Gear.....DOWN/ 3 GREEN

- ⊕ Abeam the midfield point in the downwind leg, extend the landing gear and verify that all three green landing gear lights are illuminated.

^RThrottle.....AS REQUIRED

- ⊕ Abeam the point of intended landing, reduce throttle as required for type of landing and prevailing weather conditions.

^RFlaps.....AS REQUIRED

- ⊕ Set flaps as required for type of landing and prevailing weather conditions.

^RMixture.....FULL RICH

- ⊕ Verify mixture is set to full rich.

^RPropeller.....FULL INCREASE

- ⊕ Place the propeller control in the full forward/full increase position.

^RBefore Landing Checklist.....COMPLETE

- ⊕ Verify the Before Landing checklist has been completed.

C/R	GO-AROUND
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Once committing to a go-around, the following procedure shall be conducted smoothly and rapidly to minimize continued descent and establish the aircraft in a positive climb. *Although the procedure is sequentially written, in a situation where the aircraft is very near touchdown the changes in pitch and power must be completed assertively and nearly simultaneously.*

Pitch.....LEVEL ATTITUDE

- ✦ Smoothly apply back elevator pressure to raise the aircraft nose to a level pitch attitude.

Propeller.....FULL INCREASE

- ✦ Verify propeller control is set full forward for maximum RPM.

Throttle.....FULL FORWARD

- ✦ Smoothly and positively apply full throttle and verify that maximum power is being achieved.

Pitch.....POSITIVE CLIMB ATTITUDE

- ✦ Adjust pitch attitude to initiate a climb. Set for V_X or V_Y as appropriate.

Flaps.....AS REQUIRED

- ✦ Set flaps as required for the environment and conditions. Consider leaving flaps extended if obstacle clearance requires a short-field performance climb.

CAUTION

Rapid and/or full flap retraction at lower airspeeds will cause an immediate and significant uncommanded loss of altitude in the Arrow. At the low altitudes typically encountered during go-arounds, this can result in an unexpected and hard landing, with a subsequent loss of aircraft control. Flight crews are reminded to retract flaps as appropriate, smoothly, and in increments.

Airspeed.....AS REQUIRED

- ✦ Establish V_X or V_Y climb airspeed as required and appropriate for the conditions and aircraft configuration. Maintain coordination throughout the maneuver.

Landing Gear (Out of Usable Runway).....UP

- ✦ Retract the landing gear once the aircraft has cleared any remaining usable landing surface.

Flaps (If Fully Deployed).....SET to 25°

- ✦ After established in a positive climb and clear of any obstacles, smoothly retract flaps to 25°, thereafter (regardless of initial setting when go-around was initiated) smoothly in increments appropriate to the conditions and requirements. Verify full flap retraction.

Go-Around Checklist.....COMPLETE

- ✦ Verify the Go-Around checklist has been completed.

V/R

AFTER LANDING

CAUTION

This checklist shall be executed only AFTER the aircraft has taxied off and cleared the landing runway and has come to a complete stop.

Throttle.....800 - 1000 RPM

- ⊕ Set throttle to 800 - 1000 RPM.

Flaps.....UP

- ⊕ Smoothly retract flaps.

Mixture.....LEAN

- ⊕ Lean mixture.

Fuel Pump.....OFF

- ⊕ Switch fuel pump to OFF position.

External Lights.....AS REQUIRED

- ⊕ Set external lighting as required for the conditions. Flight crews are reminded to use common sense and professional courtesy when near other aircraft or personnel, and avoid use of lighting that can negatively affect another aircraft or vehicle operator's visibility.

Transponder.....SET STDBY

- ⊕ Set transponder to STDBY.

Time On.....NOTE

- ⊕ Note time of arrival.

Taxi Route.....OBTAIN/VERIFY

- ⊕ Obtain taxi instructions (assumes controlled airport) or indicate intended taxi route (non-controlled airport). Verify taxi route using current taxi diagram for the airport of operation. Ensure that both flight crew members are clear and in agreement of the required route, including any possible high-risk areas.

After Landing Checklist.....COMPLETE

- ⊕ Verify the After Landing checklist has been completed.

Battery Master Switch.....OFF

- ⊕ Turn battery master switch to OFF position.

Lights/Electrical Switches.....OFF

- ⊕ Turn off all electrical switches.

Parking Brake.....RELEASED

- ⊕ Release the parking brake.

Hobbs/Tachometer Times.....RECORDED

- ⊕ Record ending Hobbs and Tachometer times on aircraft data sheet on can.

Flight Controls.....SECURED

- ⊕ In accordance with manufacturer recommendations, secure the flight controls by looping the seatbelt over the control yoke, drawing the control yoke back to the most aft position, and latching the seatbelt so the control yoke remains secured in this position.

Window/Door.....SECURED

- ⊕ Exit the aircraft, removing all personal items (flight gear, water bottle, lesson sheets, charts, etc.) and ensuring the cabin is clean for the oncoming flight crew. Ensure pilot-side window is securely latched closed, and cabin door is properly closed and latched (top and bottom). Install cabin cover if one is provided for the aircraft.

Tie Downs.....SECURED

- ⊕ Ensure wing and tail tie downs are snug and properly secured.

Post-Flight Inspection.....COMPLETE

- ⊕ Conduct a post-flight walk-around of the aircraft to check for any new damage or items that require assistance from Maintenance. Inform BSC Dispatch immediately of any discrepancies that require Maintenance attention.

Parking & Securing Checklist.....COMPLETE

- ⊕ Verify the Parking & Securing checklist has been completed.