REDCLIFFE AERO CLUB

Professional Pilot Training, Aircraft Hire & Charter Services

Cessna 172S

Flow Scan Study Guide

Note:

- These flow scans do not override the manufactures checklist.
- It is the Pilot In Commands responsibility to ensure that all aspects of the manufactures operating handbook are complied with.

About this Study Guide

In the cockpit of an aeroplane, the instruments and switched are arranged in specific locations based on the frequency of use, criticality, and other human factors considerations.

In order to facilitate a logical flow while initially configuring the plane, we follow a sequence of motor and eye movements. This is called a “flow-pattern”. This flow pattern can then be confirmed by verifying each item on the manufactures checklist for critical phases of the flight i.e. Before take-off. For example, it is critical that the fuel selector be placed in the BOTH position prior to take-off. If this is missed in the flow scan, it will be identified during the review of the manufactures checklist. This is critical when there is not a second crew member to cross check the pilot flyings actions. I.e. single pilot operations (most light aircraft). In a single-pilot light aircraft it is impractical to review the manufactures checklist in non-critical phases of flight, for example, before starting engine, starting engine and securing aeroplane (shutdown).

To utilise the flow scans effectively it is essential that the pilot has an understanding of the aircrafts systems.

Guidelines for Checklists

COCKPIT CHECKLISTS: CONCEPTS, DESIGN, AND USE
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1. Checklist responses should portray the desired status or the value of the item being considered, not just “checked” or “set.”
2. The use of hands and fingers to touch, or point to, appropriate controls, switches, and displays while conducting the checklist is recommended.
3. A long checklist should be subdivided to smaller task-checklists or chunks that can be associated with systems and functions within the cockpit.
4. Sequencing of checklist items should follow the “geographical” organization of the items in the cockpit, and be performed in a logical flow.
5. Checklist items should be sequenced in parallel with internal and external activities that require input from out-of-cockpit agents such as cabin crew, ground crew, fuelers, and gate agents. We note here that this guideline could conflict with No.3. and 4 above. In most cases where this occurs, this guideline (No. 5) should take precedence.
6. Critical checklist items such as flaps/slats, trim setting, etc., that might need to be reset due to new information (arriving after their initial positioning), should be duplicated on the ground phase checklists.
7. The completion call of a task-checklist should be written as the last item on the checklist, allowing all crew members to move mentally from the checklist to other activities with the assurance that the task-checklist has been completed.
8. Critical checklists, such as the TAXI checklist, should be completed early in the ground phase in order to decouple them from the takeoff segment.
9. Checklists should be designed in such a way that their execution will not be tightly coupled with other tasks. Every effort should be made to provide buffers for recovery from failure and a way to “take up the slack” if checklist completion does not keep pace with the external and internal activities.
10. Flight crews should be made aware that the checklist procedure is highly susceptible to production pressures. These pressures set the stage for errors by possibly encouraging substandard performance, and may lead some to relegate checklist procedures to a second level of importance, or not use them at all.

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STARTING ENGINE

1. Aircraft position – SUITABLE.
2. Fuel Selector - BOTH
3. Fuel Shut-off valve – IN.
4. Elevator trim – SET for take-off.
5. Wing flaps – UP.
5. Mixture – IDLE CUT-OFF.
6. Throttle – CLOSED.
7. Alternate static air – IN.
8. Interior lighting rheostats – As required.
9. Avionics master – OFF.
10. Circuit breakers – IN.
11. Avionics circuit breakers – IN.
12. Pitot heat – OFF.
13. Strobe lights – OFF.
14. NAV Lights – OFF.
15. Taxi Light – OFF.
16. Landing light – OFF.
17. Beacon – ON.
18. Fuel pump - OFF
19. Master (ALT & BATT) – ON
20. Follow priming procedure.

PRIMING – COLD START

1. Mixture – FULL RICH.
2. Throttle – FULL OPEN.
3. Fuel pump - ON for 3 SEC then OFF.
   - Fuel flow – MONITOR
4. Mixture – IDLE CUT-OFF.
5. Throttle – IDLE.

PRIMING – HOT START

NOT REQURIED

26. Brakes – TEST & HOLD pressure.
27. Propeller – CHECK clear.
28. Ignition - START
29. On 2nd firing of a cylinder

(not propeller rotation)

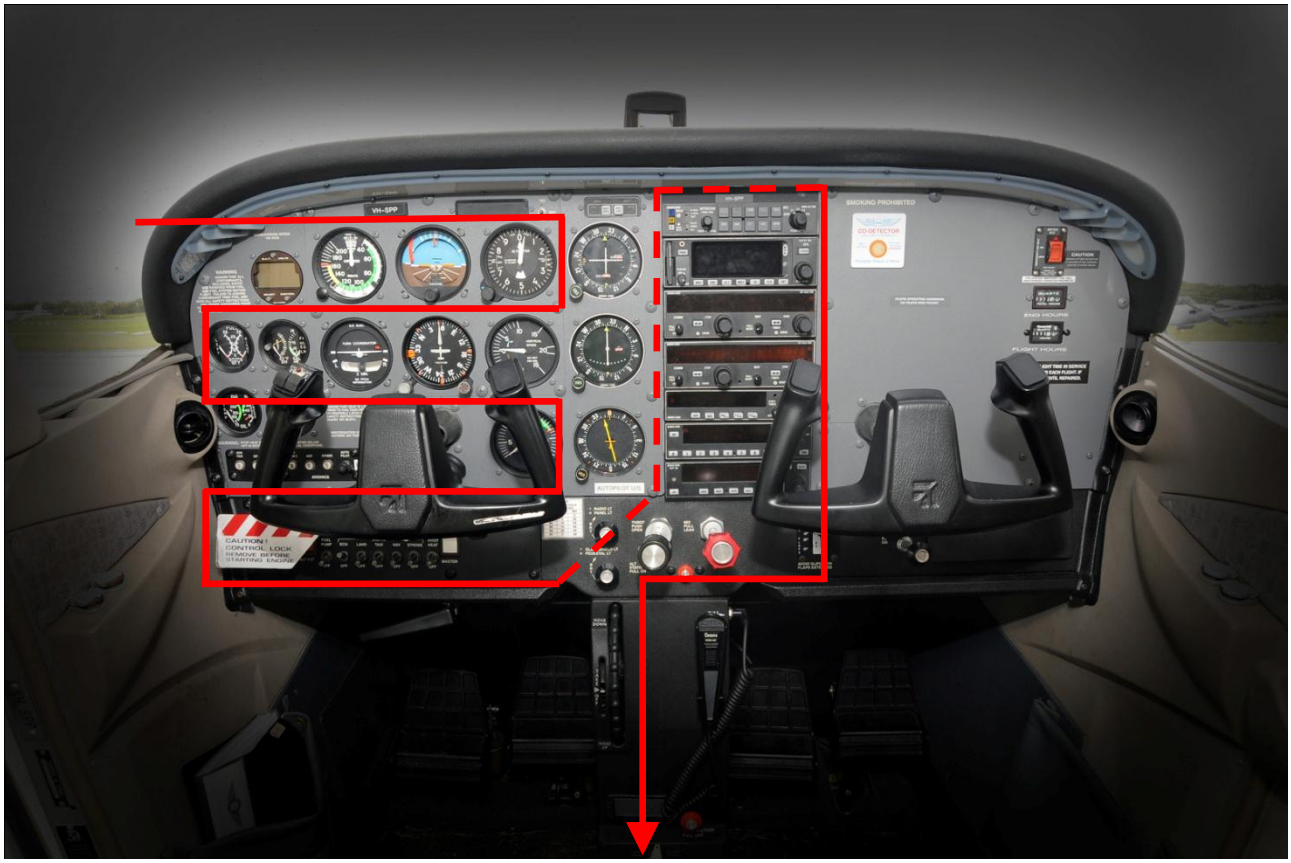
a. Starter – RELEASE.
b. Mixture – RICH.
c. Throttle – Low idle.

*NOTE: If the engine does not start after six rotations of the propeller release the starter.

AFTER START

1. Oil pressure – RISING within 30sec.
2. Ammeter – 0 or > 0.
3. Vacuum – INDICATING.
4. Taxi light – As required.
5. Nav lights – As required.
6. Avionics master – ON.
7. Mixture – LEANED for taxi.
8. Intercom – SET.
9. Radios
    a. Frequency SET.
    b. Volume SET.
    c. TEST.
    d. Taxi call.
10. Taxiway – CLEAR.

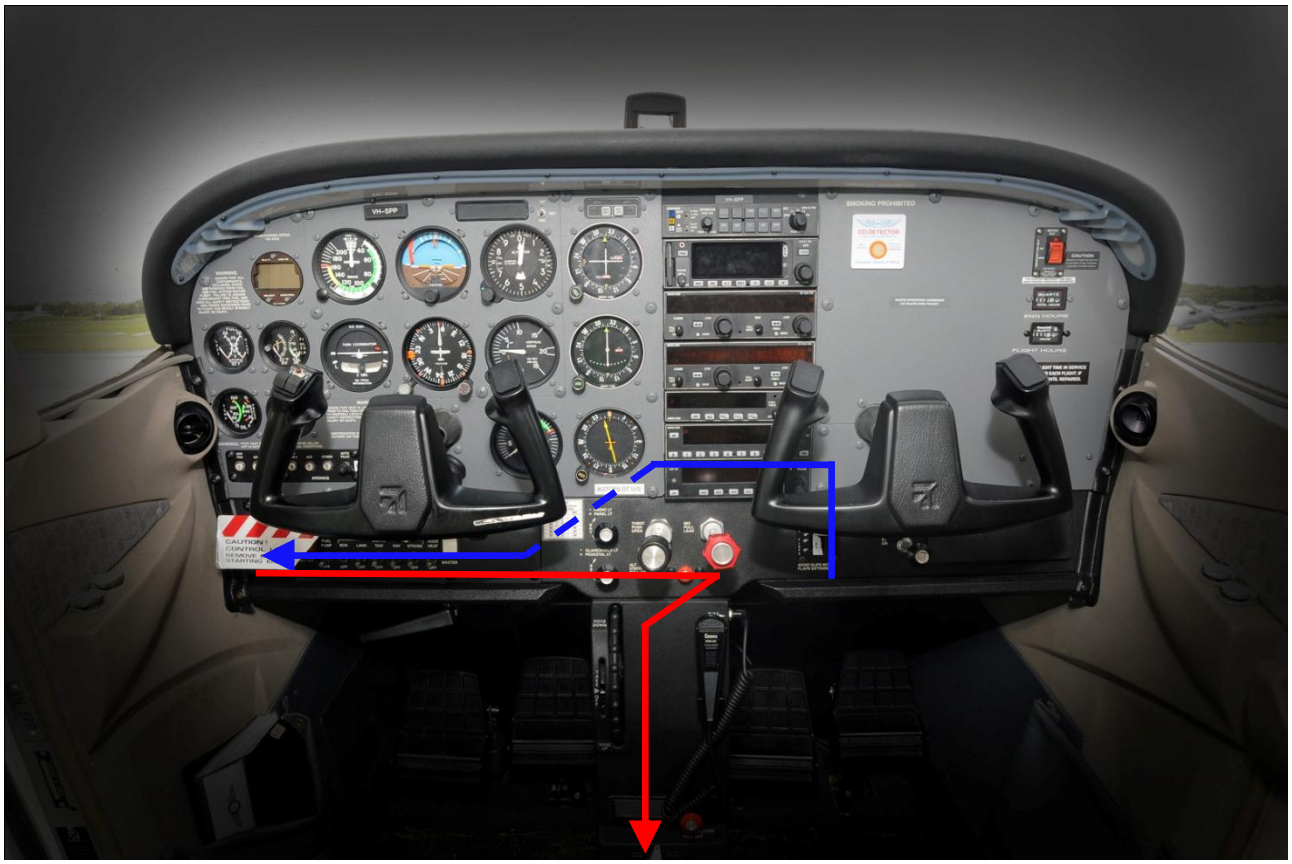
AFTER START CHECKLIST COMPLETE



BEFORE TAKE-OFF

1. Aircraft position.
    a. INTO WIND.
    b. Propeller – CLEAR of stones.
    c. CLEAR BEHIND.
2. Propeller – CLEAR of stones.
3. Clock –SET
4. Airspeed Indicator – ZERO.
5. Attitude Indicator – ERRECT.
6. Altimeter – QNH/QFE SET.
7. Fuel Quantity.
    a. CHECK calibration card.
    b. SUFFICIENT.
8. Turn coordinator.
    a. Ball – CENTRED.
    b. Flag – AWAY.
9. Directional Gyro – SET.
10. Heading bug – Runway heading SET.
11. Vertical speed indicator – ZERO.
12. Avionics circuit breakers – IN.
13. Ignition – BOTH.
14. Alternator – ON.
15. Fuel Pump – OFF.
16. Beacon – ON.
17. Landing light – OFF.
18. Taxi light – As required.
19. Nav lights – As required.
20. Strobe lights – OFF.
21. Pitot heat –
    ON IMC on departure
    OFF VMC on departure
22. Mixture – RICH
23. Check – CLEAR Behind.
24. Throttle – 1800 RPM.
25. Magnetos
    a. RIGHT – CHECK drop.
    b. Set BOTH.
    c. LEFT – CHECK drop.
    d. Set BOTH.
26. Oil Pressure – IN GREEN.
27. Oil Temperature – NORMAL.
28. Vacuum – IN GREEN.
29. Ammeter – 0 or > 0.
30. Annunciator panel – NO ANNUCIATIONS.
31. Throttle – CHECK IDLE.
32. Throttle – SET 800-900 RPM.
33. Wing flaps – SET as required for take-off.
34. Wing flaps – CHECK position visually.
35. Elevator trim – SET to take-off position.
36. Fuel selector – BOTH.
37. Seats and seat belts – SECURE.
38. Doors – CLOSED and LOCKED.
39. Flight Controls
    a. CHECK correct sense.
    b. FULL and FREE Movement.
40. CHECKLIST
    a. Obtain, check and stow.

BEFORE TAKE-OFF CHECKLIST COMPLETE



AFTER LANDING (BLUE)

1. Wing flaps – IDENTIFIED and UP.
2. Transponder – STBY.
3. Radios – Frequency SET.
4. Mixture – LEANED for taxi.
5. Pitot heat – OFF.
6. Strobe lights – OFF.
7. NAV Lights – As required.
8. Taxi Light – As required.
9. Landing light – OFF.

AFTER LANDING CHECKLIST COMPLETE

SHUTDOWN (RED)

1. Throttle – Low idle.
2. Magnetos
    a. RIGHT – Listen for drop.
    b. Set BOTH.
    c. LEFT – Listen for drop.
    d. Set BOTH.
3. Switches – OFF.
4. Avionics master – OFF.
5. Mixture – IDLE CUT-OFF.
6. Fuel selector
    a. Level ground – BOTH.
    b. Slope – LEFT or RIGHT.
7. Ignition – OFF
8. KEY – REMOVE.
9. Master – OFF.
10. Control lock – INSTALL.

SHUTDOWN CHECKLIST COMPLETE