

N12345 Cessna 340A

Serial #123456789

ANNUNCIATORS

- **LOW VOLT**
 - Bus voltage is less than 25
- **L/R ALT OUT**
 - Alternator is not generating
- **CABIN ALT**
 - Cabin altitude above 10k
- **L/R FUEL LOW**
 - 60lbs/10 gal of fuel remaining in main tank, via a float switch
- **L/R TRANS**
 - Transfer of fuel from locker tank to main is complete
- **AC FAIL**
 - Loss of alternating current power has occurred
- **WINDSHIELD**
 - Heating elements are working
- **HEATER OVHT**
 - Abnormal temp in the combustion heater has occurred and automatically been turned off. It cannot be operated until resetting of the safety device has been completed.
- **SURF DE ICE**
 - Boots have reached full inflation pressure

SPEEDS

- "Lift Off": 86 KIAS
- Vx: 86 KIAS
- Vy: 108 KIAS
- Vso: 71 KIAS
- Vmc: 72 KIAS
- Vs1: 81 KIAS
- VYSE: 105 KIAS
- Vfe flaps 15: 160 KIAS
- Vfe flaps 45: 142 KIAS
- Vle/Vlo: 140 KIAS
- Approach: 80 KIAS
- Va: 159 KIAS
- Vno: 200 KIAS
- Vne: 234 KIAS

PLANNING/PREFLIGHT

- MRW: 6430 lbs ||| MTOW: 6390 lbs ||| MLW: 6075 lbs ||| MZFW: 5630 lbs
- Max Wing Locker Weight: 120 lbs each
- Max Nose Compartment Weight: 350 lbs each
 - Nose compartment not pressurized
- Max Aft Cabin Weight: 340 lbs
- N12345 Useful Load: 1,849 lbs
- The following **payloads** are based on my boss' recommended cruise: 31in MAP, 2400 RPM, 19-20gph
 - With Main tanks full (52/50 gal usable/ea): **1,059 lbs** (range: ~2.5 hours incl. reserve)
 - With Main + Aux (31.5 gal/ea) full: **681 lbs** (range: ~3.5 hours incl. reserve)
 - If fuel-injection pump failure occurs (or the engine that powers that pump fails), aux fuel from that side becomes unusable because its a straight shot from aux tank to engines via those pumps. Only excess fuel is returned to main tanks via the fuel injection pump. Consider this possibility when planning far-out missions with few alternatives.
 - If you lose pumps,
 - Full mains and aux: endurance goes from about 3.5 hours to 2 hours incl. reserve
 - Topped off everything: endurance goes from 4.5 to 3 hours incl. reserve
 - If you lose an engine, you are only burning about 20 gph total, or about 31 gph total at full power depending on altitude and speed needs. At blue line, this is 105 KIAS times however many hours of fuel are left. This is your zero-wind range.
 - With Main + Aux + Lockers (20 gal/ea) full: **441 lbs** (range: ~4.5 hours incl. reserve)
 - SUMP NACELLE TANKS BEFORE STARTING UP!!! Until fuel flows.
 - If nacelle tank pumps fail, that fuel is dead weight and cannot be accessed. If one wing locker fuel pump dies with full tanks, endurance goes from about 4.5 to 3.5 hours total. Might be good to plan on one of them burning out when planning to fly somewhere far from alternates.
- For short flights, remember MLW is 6075 lbs - that means takeoff at MTOW requires burning ~53 gallons, or about 27 per side before landing. This is about one hour of flying.
- Takeoff above 5990 lbs require full main tanks
- Colleague recommended Long Range Cruise: 25in MAP, 2100 RPM, 15-16gph (5-6 hours)
 - Use this up in Canada with sparse fuel locations
- Service Ceiling: 29,100ft
 - Single Engine Service Ceiling : ~10,500 @ ~0° C
 - Single Engine Service Ceiling : ~14,500 @ ~-10° C
- Check both Main Tank Pumps for sound. If not working, NO GO.
- Oil Capacity: 12 quarts in sump, 13 including filter
 - Do not takeoff with less than 10 quarts per engine
 - Do not operate with less than 9 quarts
 - RH engine uses about 1 quart every 2 hours, so bring extra!
 - RH engine blows oil out bottom, LH engine blows oil out top

STARTUP & RUNUP

- If using external power and/or using it for start, all avionics and avionics master switch and alternator field switches should be to **OFF** to avoid wrecking them.
 - Battery bus will be energized upon application of external power.
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- Warm Start
 - Battery/mags/etc on
 - Mixture Full
 - Throttle "cracked," "tickle" the primer
 - Crank (might have to tickle to keep it going)
 - If it floods:
 - Idle cutoff mixture
 - Throttle up all the way
 - Crank
 - Advance mixture a little bit
 - Pull off power as it comes to life
- Once started, prime Nacelle transfer pumps until light comes off so they are ready for use
- Taxi with mixture top around 2
- For Runup:
 - Prop to bottom stops, should not be in governing range
 - Increase power to 2000 RPM, then bring prop back to feather for a second

TAKEOFF/CLIMB/AUTOPILOT

- Full power takeoff: 38 inches MAP, Full RPM
 - Vs1: 81 KIAS
 - Lift off & Vx: 86 KIAS
 - Vy: 108 KIAS
- Reduce to 33 inches MAP, 2500 RPM only 400-500 feet, or when no longer needed
- Rate of Climb: 1500 fpm
- **Feather:** must be done before falling below 1,000 RPM
 - Oil is drained from hub, and feather spring/slipstream push blades to feather
- SE Rate of Climb @ Gross, SL 75°F: 162 fpm ||| SL 50°F: 217 fpm
- SE Rate of Climb @ Gross, 2000ft 75°F: 121 fpm ||| SL 50°F: 178 fpm
- If nose cargo door opens on takeoff, do not exceed 120 KIAS. Do not lower nose abruptly as things could fly out.
- Gear is electric
 - Manual retraction should not be attempted - only extension.
 - Landing gear hand crank will disengage the electric motor, so if there is an issue with gear, check to make sure hand crank is stowed and both ldg CBs are in. If one has popped during retraction, wait 3 minutes and pop CB back in. If it pops again, land as soon as practical.
- Autopilot
 - When AP is turned ON, it will automatically go into HDG mode and PITCH mode and will hold whatever pitch that it is currently at. Use the VS/Pitch wheel to adjust pitch.
 - HDG mode seems to hold a few degrees off, so compensate for that or use the L/R correction thing near the autopilot controls
 - When AP is turned OFF, it will kick off YAW DAMP as well.
 - ALT will hold whatever altitude its at when passing

ICING

- NO AUTOPILOT USE when in severe icing. Hold wheel and disengage.
- All wing lights must be operative prior to flight in icing conditions at night
- If encountering severe icing, immediately request priority handling from ATC for route or altitude change away from icing.
 - If unusual roll response/uncommanded roll occurred, reduce AOA
- Do not extend flaps when holding in icing. This can reduce AOA and create risk of icing aft of the wing.
- Do not retract flaps until airframe is clear of ice

CRUISE

- Boss Recommended Cruise: 31 inches, 2400 19-20gph (EGT just under 16 as indicator of proper mixture)
- Colleague Recommended Long Range Cruise: 25 inches, 2100, 15-16gph (5-6 hours)
- Turbochargers should provide enough pressurization as long as engines are at at least 65% of their rated HP.
- Above FL260, see limitations on MAP
- Engine settings card found in ceiling sunshade
- Cabin heater should not be turned on unless at least one of the heat valves is all the way open (ie defrost, cabin heat, etc.). Heat should flow within about a minute. If not, turn it off, wait 30 seconds, try again, and if it doesn't work, don't try again.

FUEL MANAGEMENT

1. Wait until mains are at about 40 gallons, then transfer from Nacelle Tanks (until light comes back on). To transfer all 20 gallons to Mains will take about 45 minutes (or ~36 for L, ~39 for R in my experience). This will keep about 40 gallons in Mains for about 40 minutes, as Mains burn about 20gph in cruise.
 - a. Aux Pumps are located in Mains, and are kept on low, startup to shutdown
 - b. If Nacelle Tank Pumps fail, that fuel is just dead weight. No way to get it out.
 2. Burn Mains to 30 gallons, and then switch tanks to Aux Tanks.
 - a. Switch one tank at a time, and leave for 5 minutes before switching to the other side. This prevents total failure during switch, and accidental dual engine starvation if the pilot forgets to go back to Mains.
 - b. Aux in-line pumps provide 5.5 PSI for vapor purging. They only work when Aux switch is on low and fuel selector is on Aux.
 3. Aux will burn 31 gallons in 45 minutes. This is because fuel is pumped faster than used. Excess fuel will be sent back to Mains. After 45 minutes, mains will be very close to full. This leaves you with 2-2.5 hours on Mains.
- Fuel Selector can crossfeed from opposite side Main Tank straight to engine fuel pump and into engine. It will not transfer fuel from tank to tank.
 - Fuel Flow gage senses pressure where fuel is delivered to engine spray nozzles
 - Fuel QTY is based on weight
 - Switch to mains for descent because aux tanks, unless they're very full, may not feed engines due to location of port.
 - If one wing locker fuel pump dies with full tanks, endurance goes from about 4.5 to 3.5 hours total
 - If you lose pumps,
 - Full mains and aux, endurance goes from about 3.5 hours to 2 hours total
 - Topped off everything, endurance goes from 4.5 to 3 hours total
 - If you lose engine, you are only burning about 20 gph total, or about 31 gph total at full power depending on altitude and speed needs. At blue line, this is 105 KIAS times however many hours of fuel are left. This is your zero wind range.

ELECTRICAL

- 28 Volt DC generators + 100-amp alternators per engine, into one 24-volt battery.
- Overvoltage relay will trip alternator should it exceed normal voltage. This relay can be reset by cycling the alternator switch.
- Voltammeter will show alternator output current, battery charge/discharge current, or battery bus voltage measured.
- All switches on switch panel are "switch breakers" so they will "pop" off if CB is popped.
- Only use alternate avionics power if aviations switch, associated wiring, or battery circuits become inoperative.

LANDING

- Switch to mains for descent because aux tanks, unless they're very full, may not feed engines due to location of port.
 - No rules about landing with less than full main tanks with aux fuel still available
- Gear is electric
 - Gear horn below 15 MAP and gear up
 - Gear horn when flaps are beyond 15 degrees (first notch) and gear is not down and locked
 - Gear horn when gear placed in UP on ground
 - Landing Gear Warning CB should NOT be pulled to silence it, as this turns off ldg gear control relay and gear will not retract.
- Flaps are electric
- Stall warning horn sounds 5-10 knots above stall in all configurations.
 - Vfe 15: 160 KIAS
 - Vfe 45: 142 KIAS
 - Vle/Vlo: 140 KIAS
 - Final Approach Speed: 80 KIAS
 - Vso: 71 KIAS

GEAR PROBLEMS

- Each gear has its own switch that when pressed or unpressed correctly will stop motor.
 - Green gear lights will only illuminate when fully extended and locked.
 - Red gear unlocked light will only illuminate when any or all are unlocked
 - When neither light is on, gear is up and locked
- Squat switch is located on L main gear. When strut is compressed,
 - Pressurization valve holds open
 - Hobbs stops
 - Stall sensor vane heat goes to low level
 - Davtron clock flight timer function stops
 - Gear warning horn when selector in "up" is energized
- Landing gear hand crank will disengage the electric motor, so if there is an issue with gear, check to make sure hand crank is stowed and both ldg CBs are in. If one has popped during retraction, wait 3 minutes and pop CB back in. If it pops again, land as soon as practical.
 - Manual retraction should not be attempted - only extension.
 - If it is necessary to extend gear manually, move LDG position to "off" (middle) and pull LDG motor CB. It will take approx 50 turns, but give it an extra 4 or 5 to make sure its all locked and overcenter.
 - Keep hands on crank the whole time - don't let it go freely.

PARKING & SHUTDOWN

- Parking brake is activated by applying brake pressure and then pulling parking brake.
- If CHT is in upper half of green arc before shutting down, run engines at 600-800rpm for at least 2-3 minutes to keep oil flowing and cooling through turbocharger so that turbocharger doesn't get ruined