

LeMay Flight Training Center

BE-55B Baron - Open Book Test

Nov 2010

All questions are referenced to the FAA Flight Manual Supplement entitled “Beechcraft Baron Model 95-B55B Landplane (Military T-42A) Airplane Flight Manual” and Headquarters Department of the Army “Operator’s Manual Army Model T-42A Aircraft” TM 55-1510-208-10 which is the official flight manual required to be aboard the airplane. Serial number for N55NE is TF-5 for questions requiring that distinction.

1. The aircraft is equipped with two Continental IO-470-L engines which produce 260 horsepower each. The engines are limited to 2,625 RPM and _____ inches of manifold pressure.
 - a) 27
 - b) 29
 - c) 31
 - d) 36

2. VNE is the maximum permissible speed and is _____ KCAS.
 - a) 200
 - b) 213
 - c) 223
 - d) 234

3. The aircraft is equipped with two 40 gallon Main tanks and two 31 gallon Auxiliary tanks. The total usable fuel quantity is _____ gallons.
 - a) 106
 - b) 132
 - c) 136
 - d) 142

4. N55NE (serial number TF-5) is equipped with individually-operated single-speed electric fuel boost pumps to provide fuel pressure for starting, priming, and continued engine operation should an engine-driven pump fail. During high ambient temperature operations, the fuel boost pumps may be used for ground operations, takeoff and climb _____.
 - a) if desired
 - b) only to correct fuel pressure fluctuations
 - c) neither of the above

5. When ground temperatures are above standard and a rapid ascent is made to cruise altitude, fuel vaporization in substantial quantity may cause fluctuating fuel pressure, and unstable engine operation will result. This can be corrected by operation of the fuel boost pumps and manual leaning.
 - a) True.
 - b) False

6. VLE is the maximum speed at which an airplane can be safely flown with the landing gear extended, and is 143 KCAS in the Baron 95-B55B.

- a) True
- b) False

7. VFE is the maximum speed permissible with the wing flaps in the fully extended position, and is 148 KCAS.

- a) True
- b) False

8. Since N55NE is certified in both the Normal and Utility categories, spins are permitted if you have no passengers behind the front seats and no baggage in nose or tail.

- a) True.
- b) False.

9. The nose baggage compartment on N55NE is structurally limited to _____ pounds maximum (must still meet overall aircraft weight and balance limitations).

- a) 120
- b) 200
- c) 270
- d) 320

10. The Aft baggage compartment on N55NE is structurally limited to _____ pounds maximum (must still meet overall aircraft weight and balance limitations).

- a) 200
- b) 270
- c) 320
- d) 400

11. On N55NE (Serial number TF-5), if either 40 gallon main tank contains less than 25 gallons of fuel (about 5/8ths) you should not _____.

- a) make a turning-type takeoff
- b) takeoff immediately following a fast taxi turn
- c) both of the above statements are true

12. On N55NE (Serial number TF-5), if either 40 gallon main tank contains less than 20 gallons of fuel (about 1/2) you should avoid prolonged operation (____ or longer) in a slip or skid to prevent fuel flow interruption.

- a) 1 minute
- b) 30 seconds
- c) 20 seconds
- d) 10 seconds

13. N55NE has circuit breakers in both push-pull or toggle-type circuit breaker switches. (For example, electric fuel boost pump switches and aircraft external lights are toggle switches with circuit breakers built in. If this type of circuit breaker opens when energized the switch will appear to remain in the ON position, but the breaker will be open and the circuit will be dead.) According to the flight manual you must _____.

- a) move the toggle to OFF then to ON to reset this toggle-switch type of circuit breaker
- b) never reset a popped breaker
- c) land as soon as conditions permit

14. If operating on the main tanks when less than 1/4 full, corrective action must be taken immediately after engine failure to prevent large yaw angles, causing _____.

- a) stoppage of the remaining engine.
- b) passenger anxiety
- c) spatial disorientation

15. N55NE is equipped with a backup manual gear extension system. The manual extension crank is located at the rear of the front seats, by the feet of passengers in the second row. If the crank handle is inadvertently extended and engages the teeth, the crank handle will spin rapidly when gear is being raised or lowered. To avoid this you should _____.

- a) keep the handle secured in the disengaged position when not in use.
- b) never carry passengers
- c) ignore that checklist step requiring you to check that the crank is stowed before engine start

16. Landing gear: to extend manually, place landing gear switch _____; _____ landing gear circuit breaker. Engage handcrank at rear of the front seats and turn counterclockwise as far as possible (approximately 50 turns). Gear cannot be retracted manually.

- a) UP; push
- b) UP; pull
- c) DOWN; push
- d) DOWN; pull

17. Fuel system: Inadequate fuel for takeoff is indicated by _____.

- a) an unusually long spool-up time.
- b) yellow arc on fuel quantity gage.
- c) engines running at different RPMs.
- d) longer than normal acceleration time.

18. The fuel quantity indicator can display fuel in main or auxiliary fuel tanks as selected by the fuel quantity selector switch. The yellow arc on the fuel indicator face applies only to main tanks when fuel quantity selector switch is positioned to MAIN.

- a) True.
- b) False.

Use the PERFORMANCE table on the next page (reproduced from Flight Manual Supplement) to answer questions 19-23:

19. You are at Offutt AFB (elevation 1,000 feet), aircraft weight is 5100 pounds, winds are calm, runway is dry, and outside air temperature is 75 F. What is your Takeoff Distance?

- a) 1782 ft
- b) 1964.5 ft
- c) 2147 ft
- d) 2404.5 ft

20. You are at Offutt AFB (elevation 1,000 feet), aircraft weight is 5100 pounds, winds are calm, runway is dry, and outside air temperature is 75 F. What is your distance required to land over a 50-foot obstacle and stop?

- a) 1888 ft
- b) 1949.5 ft
- c) 2011 ft
- d) 2375.5 ft

21. You are practicing touch-and-goes at an airport just north of Colorado Springs, elevation is 7,000 feet, aircraft weight is 5100 pounds, winds are calm, runway is dry, and outside air temperature is 50 F. What is your normal rate of climb in feet per minute?

- a) 1078
- b) 988
- c) 434
- d) 210

22. You are practicing touch-and-goes at an airport just north of Colorado Springs, elevation is 7,000 feet, aircraft weight is 5100 pounds, winds are calm, runway is dry, and outside air temperature is 75 F. What is your balked landing (go around) rate of climb with takeoff power, gear and flaps down, and a climb speed of 80 KCAS?

- a) 526.5 ft/min
- b) 560 ft/min
- c) 503.5 ft/min
- d) 447 ft/min

23. You are practicing touch-and-goes at an airport just north of Colorado Springs, elevation is 7,000 feet, aircraft weight is 5100 pounds, winds are calm, runway is dry, and outside air temperature is 75 F. What is your single engine rate of climb with maximum continuous power on the operating engine, gear and flaps up, propeller feathered on the inoperative engine, and best rate of climb speed (blue line) corrected for altitude?

- a) 128 ft/min
- b) 77.5 ft/min
- c) 27 ft/min
- d) -2.5 ft/min

“PERFORMANCE:

The following performance figures are obtained during the official FAA Flight Tests and may be realized under conditions indicated with the airplane and engines in good condition and with average piloting technique.

All performance is given for a maximum weight of 5100 pounds. Takeoff and landing distances are given for no wind and level paved runways. In using the following data, allowance for actual conditions must be made.”

| Item | Altitude (feet) | Outside Air Temperature | | | | |
|---|--------------------|-------------------------|------|------|------|-------|
| | | 0 F | 25 F | 50 F | 75 F | 100 F |
| <u>Takeoff distance (ft).</u> Distance required to takeoff and climb to 50 feet, takeoff power, flaps up. Takeoff speed, 82.5 knots (95 mph) CAS | S.L. | 1304 | 1454 | 1614 | 1782 | 1959 |
| | 2000 | 1570 | 1752 | 1945 | 2147 | 2361 |
| | 4000 | 1904 | 2125 | 2358 | 2604 | 2863 |
| | 6000 | 2305 | 2573 | 2855 | 3153 | 3466 |
| | 8000 | 2808 | 3134 | 3479 | 3842 | 4225 |
| <u>Landing distance (ft).</u> Distance required to land over 50-foot obstacle and stop. Flaps full down. Approach at 89 knots (102 mph) CAS. | S.L. | 1654 | 1733 | 1811 | 1888 | 1965 |
| | 2000 | 1763 | 1847 | 1930 | 2011 | 2092 |
| | 4000 | 1881 | 1969 | 2056 | 2142 | 2227 |
| | 6000 | 2007 | 2100 | 2192 | 2282 | 2372 |
| | 8000 | 2141 | 2240 | 2337 | 2432 | 2526 |
| <u>Normal rate of climb (ft/min).</u> Maximum continuous power, gear and flaps up. Best rate of climb speed, 105 knots (121 mph) CAS at sea level. Reduce 1 mph per 1000-foot increase in altitude. | S.L. | 1810 | 1753 | 1703 | 1646 | 1593 |
| | 2000 | 1635 | 1579 | 1524 | 1468 | 1413 |
| | 4000 | 1462 | 1404 | 1347 | 1289 | 1231 |
| | 6000 | 1289 | 1228 | 1168 | 1108 | 1049 |
| | 8000 | 1114 | 1051 | 988 | 927 | 866 |
| <u>Balked landing rate of climb (ft/min).</u> Takeoff power, gear and flaps down. Climb at 80 knots (92 mph) CAS. | S.L. | 950 | 935 | 916 | 900 | 880 |
| | 2000 | 844 | 825 | 805 | 785 | 740 |
| | 4000 | 735 | 715 | 695 | 672 | 652 |
| | 6000 | 625 | 605 | 583 | 560 | 540 |
| | 8000 | 515 | 495 | 470 | 447 | 424 |
| <u>Single-engine rate of climb (ft/min).</u> Maximum continuous power, gear and flaps up, propeller feathered on inoperative engine. Best rate-of-climb speed, 101 knots (116 mph) CAS at sea level. Reduce 1.0 mph per 1000-foot increase in altitude. | S.L. | 385 | 355 | 330 | 301 | 272 |
| | 2000 | 302 | 273 | 244 | 214 | 185 |
| | 4000 | 219 | 188 | 158 | 128 | 98 |
| | 6000 | 134 | 103 | 72 | 41 | 11 |
| | 8000 | 49 | 17 | -15 | -46 | -76 |

Use the following table to answer questions 24 and 25.

| | Weight: | Arm: | Moment: |
|---|---------|-------|-----------|
| Aircraft Basic Empty Weight (without 5 th & 6 th seats installed): | 3384.5 | 76.93 | 260,379.0 |
| Nose baggage | | 31 | |
| Pilot and copilot | | 85 | |
| 2 nd row (3 rd & 4 th seats) in FORWARD position | | 121 | |
| 2 nd row (3 rd & 4 th seats) in AFT position | | 136 | |
| 3 rd row (5 th & 6 th seats), normally removed, Aft baggage | | 155 | |
| Main fuel tanks (max 74 gals @ 6 lbs per gallon = 444 lbs) | | 75 | |
| Aux fuel tanks (max 62 gals @ 6 lbs per gallon = 372 lbs) | | 93 | |
| Total Loaded Airplane: | | | |

Given:

Nose baggage of 25 lbs.

Pilot of 180 lbs, copilot of 220 pounds.

Adult passenger in second row, aft seat position, 205 lbs.

Child in car seat in second row, forward position, 35 lbs (including car seat).

Aft baggage, 52 lbs.

Full fuel.

24. What is the total weight and moment?

- a) 4887.5 lbs and 379,305 lb/inches
- b) 4917.5 lbs and 400,675 lb/inches
- c) 5033.5 lbs and 420,523 lb/inches
- d) 5107.5 lbs and 433,789 lb/inches

25. What is the C.G. location in inches?

- a) 77.79 inches
- b) 79.12 inches
- c) 81.48 inches
- d) 84.05 inches