The ABS/BPPP Guide to Initial Pilot Checkout

IO-520/IO-550 Bonanzas/Debonairs (normally aspirated)
Models S35 V35 V35A V35B C33A E33A E33C F33A F33C 36 A36 G36

The American Bonanza Society Air Safety Foundation highly encourages pilots receiving initial checkout in a Beech Bonanza or Debonair work with a flight instructor knowledgeable about the specific make and model and current in its operation. Resources include the Beechcraft Pilot Proficiency Program (BPPP), a wholly owned subsidiary of the ABS Air Safety Foundation, and individual BPPP instructors who may be located near the pilot's location or willing to travel to provide instruction. See www.bppp.org for training dates and locations, and contact information for BPPP-standardized CFIs.

Frequently, however, an airplane purchase does not coincide with a BPPP training date or location, or for any number of reasons a new owner/pilot is unable to schedule training with a Bonanza/Debonair-savvy instructor. For that event the ABS Air Safety Foundation has created this training outline for pilots and their local instructors to address the most vital topics and operations during the critical initial checkout in a Bonanza or Debonair. This outline is not intended as a substitute for a thorough checkout by an instructor knowledgeable about the specific make and model and its current operations. This outline cannot address all topics, and the ABS-ASF and BPPP cannot be responsible for providing timely updates on information contained in this Guide. A necessary, thorough avionics checkout is outside the scope of this Guide because of the wide variety of avionics installed in individual aircraft.

We strongly encourage pilots to complete their type-specific checkout at the next BPPP Initial Training event in their area, then attend BPPP Recurrent Training annually as part of an aeronautical lifelong learning program.

Pilots completing this syllabus earn 50 points in the ABS AVIATOR program. See the ABS AVIATOR description for program details. Have the CFI who conducted training send ABS your name, aircraft registration (N-number) and the date you completed the entire syllabus to absmail@bonanza.org.

Please direct any questions to absmail@bonanza.org or 316-945-1700. Enjoy your introduction to the Beechcraft Bonanza or Debonair!

Aircraft preflight check

ITEM	TOPIC	TASK
1	Aircraft documents	• Required documents (FAR Part 91) Required inspections and certifications (FAR parts 43, 91) • Current GPS database, if IFR GPS to be used.

2	Current compliance with all recurring and one-time Airworthiness Directives	Including but not limited to: • Uplock rollers last lubed and when next due • Spar web dye penetrant check and when next due • (V-tail) Rear bulkhead inspection and when next due • (Model 33, 36) Rudder spar inspection and when next due See the following items on the ABS website Members Only page: • How to conduct an Airworthiness Directives search for your aircraft • Checklist for subscribing to receive Airworthiness Directives (ADs) and Special Airworthiness Information Bulletins (SAIBs) by email • Spar web inspection Bonanza/Debonair AD95-04-03 and Bonanza/Debonair MSB 2360 (pre-June 2004) • V-Tail Fact Sheet for the S35 through V35B • Model 33 and 36 Rudder Spar Inspection AD
3	Discuss creating an airplane status board to track all airplane currency requirements.	Discuss a sample aircraft status board

Pilot and instructor preflight check

ITEM	TOPIC	TASK
1	Comply with all regulatory, certification and recency of experience requirements applicable to the flight.	• FAR 61, 91 • Comply with the requirements of FAR 91.109(a) and (b)(3), including any FAA exemption specifically granted to the instructor See the following items on the ABS website Members Only page: • Flight Instruction in Single-Control Beechcraft -- the rules, exemptions, IFR checkrides and dual yoke rentals.
2	Comply with any insurance requirements.	• Ensure the pilot is authorized to receive instruction in the airplane under the owner's aircraft insurance policy. (see "Approved Pilots" in the policy) • Ensure the instructor meets any aircraft

		insurance policy Open Pilot Warranty or is otherwise authorized to provide flight instruction under the owner's aircraft insurance policy. • Review and comply with any insurance policy pilot checkout and/or dual instruction requirements before solo and/or carrying passengers. Contact the aircraft owner's insurance agent or broker to answer any questions before flying.

Aircraft systems review

ABS recommends the pilot and instructor independently read the entire Pilot's Operating Handbook (POH) and POH Supplements before beginning training. Then review and discuss system design and operation with special emphasis on (but not limited to) items listed below.

ITEM	TOPIC/TASK	AMPLIFICATION
1	POH Section II, Limitations	• Airspeed limitations • Instrument markings • Weight and center of gravity limitations • Approved maneuvers and entry speeds • Minimum fuel required in each main tank for approved maneuvers • Flight in icing conditions prohibited (unless modified by STC) • Kinds of Operations and Equipment chart See KOEL article • Any limitations contained in POH Supplements for installed optional or aftermarket equipment
2	POH Section III, Emergency Procedures	• Emergency airspeeds • All Emergency Procedures checklists
3	POH Section IV, Normal Procedures	• Airspeeds for Safe Operation • All Normal Procedures checklists • Supplemental oxygen endurance calculations (if equipped)

4	POH Section V, Performance	• Compute expected airplane performance for conditions the pilot anticipates to be "normal" and "possible" to confirm the pilot's ability to use the charts. • Associated conditions and airspeeds necessary to get computed performance. • Adjustments to computed performance figures for G36s, and A36s serial number E-1946, E-2103, and E-2111 through E-3635, per page 5-3 and 5-4 of each model's POH. See How to Use Performance Charts • Adjustment to performance figures, associated conditions or airspeeds from any POH Supplements for optional or aftermarket equipment
5	POH Section VI, Weight and Balance	• Seating, baggage and equipment arrangements • Center of gravity shift rearward with fuel burn from main tanks • Necessity to compute landing condition c.g. as well as takeoff o Discuss limits to flight endurance as needed to remain within c.g. limits for landing • Compute weight and balance for conditions the pilot anticipates to be "normal" and "possible" to confirm the pilot's ability to use the charts See How to Make Weight and Balance Calculations • Adjustment to weight and balance limitations or characteristics from any POH Supplements for optional or aftermarket equipment
6	POH Section VII, Systems Description Although most information on this topic comes from Section VII of	**Doors, Windows and Exits** • Procedure to properly secure and check the forward cabin door • Operation of openable emergency exit

	the POH or appropriate POH supplements, some items reference Section II, Limitations, Section V, Performance or other sources.	windows • Operation of aft cargo or utility doors • Passenger emergency exit briefing • Airspeed limitation on pilot's storm window **Seats** • Seat adjustment • Seat belt and shoulder harness use for crew and passengers **Flight controls** • Operation of throw-over control yoke, if equipped • Adjustment of rudder pedals • Trim system o Operation o Position indication o Takeoff position • If equipped with electric pitch trim, see the POH supplement for: o Operation o Pitch trim runway emergency procedure **Flaps** • Flap switch operation • Flap position indicating system • Review flap speed limitations, POH Section II, with emphasis on: o Maximum flap extension/extended speed (V_{FE}) • S35 – V35B; C33A – F33A; 36- A36 model

		year 1983 o Takeoff with flaps extended is not prohibited but there is no data provided with which to make a performance calculation. • A36 model year 1984 and after; G36 o Takeoff performance charts with zero flaps and approach flaps o Make comparative performance calculations: ▪ Under the same conditions, calculate ground roll and 50-ft obstacle distances with zero and approach flaps. ▪ For a given takeoff flap setting, calculate ground roll and 50-ft obstacle distances at various weights, field elevations and/or ambient air temperatures. ▪ Derive rules of thumb for whether flaps improve takeoff and initial climb performance under various conditions of weight and density altitude. **Engine and Propeller** • Cowling latch operation • Cowl flap operation and when to open cowl flaps • Alternate induction air system operation • Starter operation, including STARTER ENERGIZED annunciator if applicable • Starter limitation: no more than 30 cumulative seconds of starter activation in a consecutive 4-minute period • Manifold pressure and fuel flow indicator

		○ Takeoff leaning recommendations • Starting checklist ○ Normal, hot and flooded start procedures ○ Starter limitations ○ Caution regarding ammeter indications after engine start • Takeoff and climb power recommendations ○ Mixture control during takeoff ○ Automatic leaning in an airplane equipped with an IO-550 and an altitude compensating fuel pump • Leaning using the exhaust gas temperature (EGT) indicator or engine monitor ○ Alternative leaning techniques (ROP / LOP) • Review Limitations, POH Section II, with special emphasis on: ○ Powerplant limitations ○ Powerplant instrument markings ○ Engine preheat recommendations • Review MacCauley propeller AD if applicable ○ Required instrument panel placard **Fuel system** • Total fuel quantity • Usable and unusable fuel • Limitations: ○ Minimum fuel quantity in each main tank for takeoff ○ Maximum continuous slip limitation • Preflight visual inspection

		• Fuel strainer locations
		• Fuel vent locations
		• Quantity and routing of return fuel
		• Fuel tank selection
		• Use of the auxiliary fuel pump
		• If equipped with tip tanks, see the POH Supplement for:
		  o Tip tank fuel quantity indicating systems
		  o Fuel tank selection and/or fuel transfer
		  o Routing of return fuel when tip tanks are in use (if the system directly feeds the fuel selector)
		  o Fuel strainer and vent locations
		  o Auxiliary fuel system limitations
		  o Rate and time to transfer fuel from tips to mains
		
		Landing gear and brakes
		• Gear switch operation
		• Landing gear position indicators
		• Landing gear warning horn and annunciator (as appropriate)
		• Manual extension procedure
		  o Crank until unable to crank further
		• Brakes operation
		  o Presence or lack of brakes on the pilot's side
		  o Need to brief how instructor will command the pilot to increase braking when needed, if not equipped with dual brakes
		• Parking brake operation

		Electrical system
		• Normal and standby systems
		• Monitoring systems and annunciators
		• Standby generator
		  o Test procedure
		  o What it powers, what it does not
		• Standby alternator
		  o Test procedure
		  o Monitoring and load-shedding
		See this on the Members Only page of the ABS website: Most Bonanza/Baron POHs do not contain an Electrical Fire or Overheat emergency checklist. Read "Are You Prepared for an Electrical Fire?"
		
		Environmental system
		• Heater operation
		• Maximum defroster operation
		• Cabin ventilation system operation
		  o Include using the firewall shutoff valve to cool the cabin
		  o Air conditioning system operation
		  o Limitation: Off for takeoff
		  o Reduce all performance by 5% when air conditioner is operating, if applicable.
		
		Pitot/static system
		• Optional emergency static air source operation
		• Instrument calibration while using emergency system (from POH Performance section)

		Instrument Air • Vacuum System or Instrument Air Pressure System • Normal "green arc" indication on cockpit gauge o Factory or aftermarket backup instrument air sources ▪ GYRO WARNING and STANDBY AIR annunciator lights ▪ Operation of the backup system ▪ Which instruments are powered by primary and backup systems
7	Preflight inspection	• Review Preflight Inspection checklist

Flight training

General recommendations

These recommendations result from experience, as techniques for avoiding the most common types of Bonanza/Debonair accidents. Use them at your discretion.

- Do not perform touch and goes. There is a high correlation between touch and goes and inadvertent landing gear retractions on the runway. A large number of loss-of-control accidents also occur during the high workload on-runway phase of a touch and go. Make all landings to a full stop and take time to reconfigure for another takeoff and pattern.
- Do not retract the flaps on the landing rollout. Reconfigure the plane once stopped on the taxiway clear of the runway.
- Be familiar with the weight and balance of your plane. As fuel burns your CG moves aft. For each flight two weight and balance calculations should be done. The first calculation should be with fuel and cabin load prior to takeoff. The second should be done with the fuel calculated to be remaining when you arrive at your destination or alternate. You

may be under maximum gross weight and in CG at departure but beyond the aft cg limit upon reaching your destination.

- Plan on having a minimum of one hour of fuel on board upon arriving at your destination or alternate. Avoid a planned fuel stop within one hundred miles or one hour of your destination. There is a great temptation to over fly the fuel stop and continue to your destination. If fuel prices or other factors cause you to select a refueling airport near your ultimate destination, consider that first stop your destination and make all fuel computations, reserves and decisions based on flight to that airport.

- Always use checklists. On landings use GUMPS as a challenge response. Confirm the Gas (fuel) selector is on a main tank that has adequate fuel for approach, landing and, if necessary, missed approach or a balked landing; *U*ndercarriage lever is down and indicators confirm gear down; *M*ixture, full rich or as required by altitude; *P*ropeller, high rpm; *S*eatbelts and shoulder harnesses secure.

- Undertake a program to insure your currency. Each month select a new area to concentrate on. Examples would be: instrument currency, night operations, short, soft and crosswind take offs and landings, GPS approaches and holds, slow flight and stall recognition etc. See training opportunities recognized by the ABS AVIATOR program for ideas.

Remember this checkout covers only the basic information absolutely necessary for an initial checkout. Plan on attending BPPP ground and flight training next time it is held in your area to learn much more about your Bonanza or Debonair and how to safely fly it to its maximum potential. Then include BPPP recurrent training annually thereafter, or every other year to satisfy your Flight Review requirement. See www.bppp.org for a course description and scheduling information.

By The Numbers

The "by the numbers" technique is taught to provide a simple, consistent way to conduct flight, especially instrument flight, with smoothness of control. MPH equivalents provided to be used when applicable for the model of airplane. If possible, adjust the airplane bar to zero degrees during cruise flight and do not adjust further. Power settings and airplane configurations will result in the approximate performance tabulated. Adjust these numbers as necessary for your airplane under current conditions.

Condition	Power	Attitude	Configuration	Performance
Initial climb	Full throttle 2,700 rpm	+10 degrees	Clean	96 knots/110 mph ~1200fpm at sea level, standard day
Cruise climb	Full throttle and 2500 rpm	+5 degrees	Clean	115 knots/132 mph 500fpm
Cruise	Max MP for cruise lowest rpm available for desired horsepower	0 degrees	Clean	150 to 170 knots/172 to 196 mph
En route descent	17 inches and 2300 rpm. If above 7000 feet and at full throttle reduce rpm to start the decent	-2 degrees	Clean	150 to 170 knots/172 to 196 mph 500 fpm decent
Intermediate level off	17 inches and 2300 rpm	+1 degree	Clean	105 knots/120 mph
Let down at FAF to MDA/DH/DA	15 inches and 2300 rpm	0 degrees	Gear down	105 knots/120 mph 500 fpm
Level off at MDA	20 inches and 2300 rpm	+2 degrees	Gear down	105 knots/120 mph
Missed approach/ balked landing	Full throttle and 2700 rpm	+10 degrees	Gear/ flaps up	96 knots/110 mph

Power, Attitude and Configurations recommendations provided by BPPP, Inc.

Reducing manifold pressure by 1 inch provides a roughly 100-fpm descent. A 5-inch reduction in MP results in a 500 fpm descent.

Flight Training Syllabus

Syllabus items may take several flights to accomplish, and may be presented in any order as conditions require and/or at the discretion of the pilot and instructor. The instructor may incorporate Scenario-Based Training techniques but should ensure that, at a minimum, all Tasks are covered during the checkout

ITEM	TOPIC/TASK	AMPLIFICATION
1	Preflight inspection	• Orderly habit pattern • Checklist use
2	Startup and taxi	• Flows and checklist use • Develop an orderly cockpit for single-pilot operations • Do not program avionics while taxiing

3	Takeoff and initial climb	• Flows and checklist use
		• Technique and speeds per the POH performance charts
		  ○ Normal takeoff
		  ○ Crosswind takeoff
		  ○ Short-field takeoff
		  ○ Soft-field takeoff
		• Engine management including mixture control
		• Use the Power, Attitude and Configuration (PAC) recommendations.
		• Forward cabin door unlatched:
		  ○ Do not attempt to close the door in flight.
		  ○ The airplane flies nearly the same with the door open.
		  ○ Land and then secure the door.
		  ○ Pilot distraction is the biggest hazard.

4	Cruise climb	• Flows and checklist use • Engine and mixture management
5	Level-off and cruise	• Transition to level flight • Flows and checklist use • Engine and mixture management
6	Normal maneuvering	• Standard rate turns • Normal (30° bank) turns
7	Steep turns	• Begin below weight-adjusted V_A ○ Reduce POH V_A by 2 knots for every 100 pounds below maximum weight
8	Slow flight	• Mixture: full rich • Monitor cylinder head temperature. Use mixture and cowl flaps as necessary
9	Spiral tendency demonstration and recovery	• Enter at 90 to 100 knots • Allow the airplane to roll to 50° to 60° bank angle (do not exceed 60° bank) • Recover at V_A or 60° bank. • On the rollout, forward pressure will be needed on the yoke See Demonstrating the Spiral Tendency and Recovery

10	Stall recognition and recovery	• Mixture full rich or set for density altitude. • Ailerons neutral and ball centered at the stall and during recovery • Takeoff and departure stalls (power on) • Approach to landing stalls (power off) • Accelerated stalls below weight adjusted V_a (wings level and turning. • Trimmed stalls ○ power-off and power-on stalls with pitch trim set at the typical landing position of 6 to 9 units up. (19 to 21 units UP in turbonormalized airplanes)
11	Simulated engine failure/power-off glide	• Insure the aircraft is in the clean configuration • Pull the prop control full out to insure max glide in distance • For minimum decent rate the speed is approximately 25% less than best glide See Demonstrating the Power-Off Glide
12	Manual landing gear extension	• Checklist use • Slow to 100-110 knots • Pilot should move the seat aft and recline the seat back. The front passenger should move the seat forward for better access to the manual gear handle. • Do not retract the landing gear manually. See Manual Landing Gear Extension
13	Instrument procedures (for pilots intending to exercise instrument rating privileges)	• Use PACs. • Flows and checklist use • Instrument Proficiency Check required items (FAR 61, Instrument Pilot Practical Test Standards)
14	Visual approach and landing	• Flows and checklist use • Normal landing • Crosswind landing • Short-field landing • Soft-field landing • No-flap landing • Do not reconfigure the airplane until stopped on the taxiway. • Rejected landing ("go-around")
15	Taxi and shutdown	• Flows and checklist use

Knowledge questions

At the minimum, the pilot should know the answers to the following questions:

- What is the total usable fuel?
- What is the endurance with a one-hour reserve at the pilot's normal cruising altitude and power setting?
- What issues arise from inadvertently running a fuel tank completely dry? Is it advisable to purposely run a tank dry and, if so, when and under what circumstances?
- What is the maximum oil capacity in quarts?
- How much payload will the airplane carry with maximum fuel?
- How much fuel can you carry with the following payload?
  - The total front seat occupants weight is 400 pounds,
  - The total middle seat occupants weight is 300 pounds and
  - The total baggage weight is 100 pounds
- Assuming you load that amount of fuel for takeoff, after burning 40 gallons will the CG be within limits?
- What is the maximum demonstrated crosswind component?
- What are the indications of a vacuum/instrument air system failure?
- What instruments are affected by a vacuum/instrument air system failure?
- What is the sequence of events to performing a manual gear extension?
- How many fuel drains are there?
- What is the procedure for an unlatched door in flight?
- When and how is the auxiliary fuel pump used?

Following this initial checkout we strongly encourage the pilot completes his/her type-specific training at the next BPPP Initial Training event in the area, and attend BPPP recurrent training thereafter as part of an aeronautical lifelong learning program. See www.bppp.org for locations and scheduling information.