VAN'S AIRCRAFT
TOTAL PERFORMANCE

RV-12iS
PRODUCTION ACCEPTANCE PROCEDURES

AIRCRAFT SERIAL NUMBER: _____

ASTM F 3035-13 states that the manufacturer (Van's Aircraft) shall maintain a Quality Assurance Record (QAR) for each LSA produced. The QAR shall consist of (among other records) "Applicable final inspection records, check, and test documentation from the production acceptance procedures"

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REVISION SUMMARY

Whenever revisions are issued, they must be inserted in the appropriate place in the manual. A black vertical line along the left margin of the page will identify revised text and illustrations. Changes in spelling, punctuation and formatting will not be marked.

To verify the latest revision of the PAP, compare the revision level found on the cover page with the latest revision posted on the RV-12iS Service Information page of the Van's Aircraft web site.

Rev	Page	Change	Date
0	None	Initial Release	05/03/2018
1	Multiple	Publication	10/22/2018
2	G1-1	Deleted "SV-AP optional panel or" from last paragraph	11/15/2018
	G2-2	Added: "Ensure trim tab in TAKEOFF position"	
		Added: "±1/8" to 7 5/16 measurements.	
2.1	Appendix Cover Page	Added cover page and explanation of appendix usage.	11/5/19
	Appendix 2	SLSA Flight Test completely re-written	
	Appendix 4	Service documentation updated to new terminology (SD, SB, SL) was (SA,SB,N).	
2.2	F4-3	Replaced Garmin GTN 650 with Garmin GTN 650Xi.	09/08/20
	G1-1	Clarify cooling fans should move air in opposite directions.	
	G4-1	Replaced "torqueing" with "tightening" for radiator pipe plug install.	
	G6-2	Added instruction to dynamically balance the propeller after the initial ground run.	
	Appendix A3-1	Replaced GTN 650 with GTN 650Xi.	

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INTRODUCTION

This manual provides the Production Acceptance Procedures for the RV-12iS Light Sport Aircraft, in accordance with ASTM Standard F3035-13. These test procedures are designed to efficiently ensure your aircraft and systems function properly and meet handling expectations and performance requirements set forth in the Pilot's Operating Handbook. The test procedures should be completed in the order in which they are presented.

The process starts with a series of ground tests and procedures that ensure all systems are functioning properly and prepare the airplane for initial flight. This is followed by a taxi test and a series of flight tests that will verify the aircraft operation, handling, and performance characteristics. After the flight tests are complete there is a final Post Flight Test Check.

Some of these procedures are specific to the engine installed on your RV-12iS. Procedures denoted by (iS) are specific to the 912iS engine, while procedures denoted by (ULS) are specific to the 912ULS engine. Procedures which do not have a specific notation apply to both engine installations.

These procedures will help you to become familiar with your RV-12iS. Upon completion of these tests you should continue exploring the performance and handling characteristics of your aircraft within the approved flight envelope. More information can be found in the Flight Training Supplement.

Section G1 - Systems Check

SWITCHES & CIRCUITS:

- ❑ Download the latest "Read Me" file, firmware, and configuration files for your EFIS from the Downloads page of the Van's Aircraft website.
  NOTE: The read me document explains the process of downloading and installing Van's Aircraft factory settings for the RV-12iS, including TRIM take off and AP servo configuration, etc.

- ❑ Check (during the first 5 mins after the hour) ELT function using test switch in the remote panel.
- ❑ Master switch "ON".
- ❑ Verify that the avionics cooling fans come on and move air in opposite directions, one into the instrument bay and one out of the instrument bay.

- ❑ (ULS) Verify that the electric auxiliary fuel pump turns on (noticeable clacking noise).
- ❑ (ULS) Master switch "OFF"
- ❑ (ULS) Remove fuel pump fuse and tape it to the top of the pilot control stick
- ❑ (ULS) Master switch "ON".

- ❑ (iS) "Fuel Pump 1" switch "ON".
- ❑ (iS) Verify that Fuel Pump #1 turns on.
- ❑ (iS) "Fuel Pump 2" switch "ON".
- ❑ (iS) Verify that Fuel Pump #2 turns on.
- ❑ (iS) Turn both fuel pump switches off.

- ❑ Verify EFIS display comes on.
- ❑ Connect a battery charger (compatible with your battery) to bring the bus voltage to approximately 13.6 volts.

- ❑ Follow the instructions in the downloaded "Read Me" file to update and configure your EFIS per the manufacturer's instructions.
- ❑ Actuate "NOSE UP" side of trim switch.
- ❑ Verify that when holding the trim switch the motor stops after 6 seconds and requires cycling the switch "OFF" then "ON" to continue motion. **NOTE: The built in "Runaway Trim" function prevents a stuck switch from moving the trim tab too far in order to avoid extreme "out of trim" conditions.**
- ❑ Continue to cycle the switch until the trim motor reaches full "NOSE UP" travel.
- ❑ Verify that the tab is trailing edge down from the stabilator trailing edge.
- ❑ Actuate "NOSE DOWN" side of trim switch and use a stopwatch to determine how long it takes the motor to run full travel. Remember to quickly cycle the switch off every 4 seconds to allow nearly continuous motion. Run time: _____seconds.

  NOTE: Auto Trim is provided when the SV-AP optional panel or Garmin AP pitch servo is installed. On the ground the trim speed will run faster with auto trim.

  Auto trim overrides the AV-60000 trim speed adjustment. This is true for Garmin when the AP is on. If the SV AP Knobs is installed auto trim is always active.

  The trim motor will not operate if AV-60000 trim speed adjustment is set too low when the Garmin AP Pitch Servo is installed.

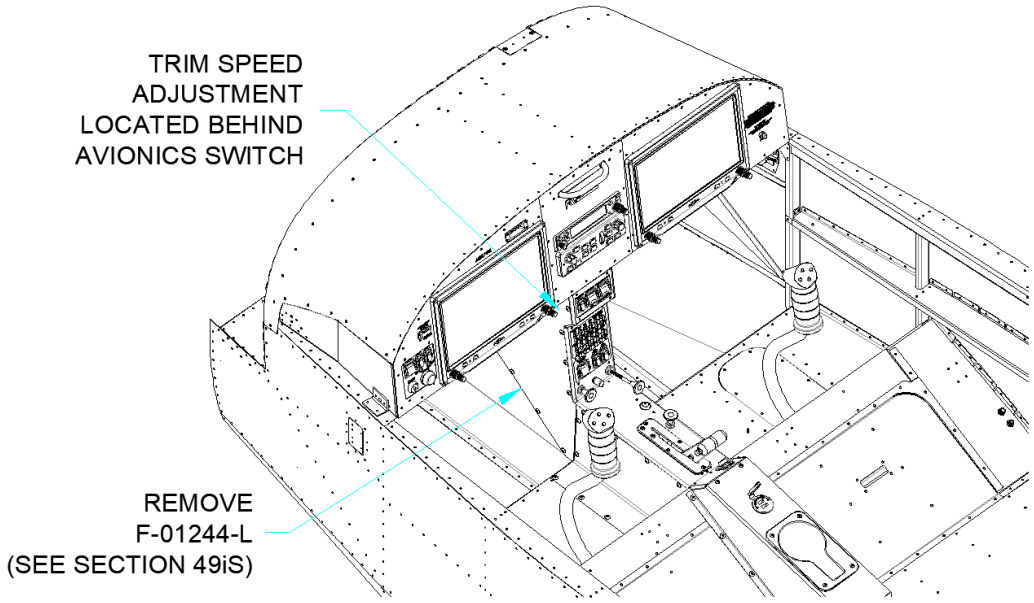

FIGURE 1: ACCESSING THE TRIM SPEED CONTROL KNOB

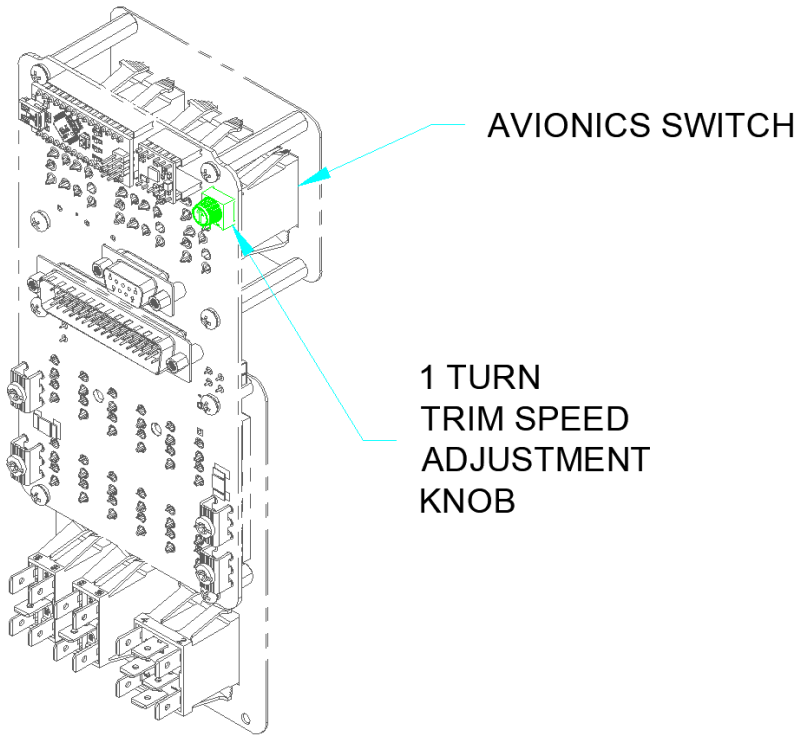

FIGURE 2: TRIM SPEED ADJUSTMENT KNOB LOCATION ON THE AFT SIDE OF THE AV-60000 POWER MODULE

If no Autopilot Installed:

- ❑ Adjust AV-60000 to set run time for the trim motor to be between 25 and 30 seconds. See Figure 1 and Figure 2 for the location of the 1-turn knob that allows adjustment of the trim speed.

If a Garmin Autopilot is Installed:

- ❑ Adjust AV-60000 trim adjustment knob to the minimum position that will allow trim motor to operate, then adjust an additional 1/8 turn clockwise.

If a Dynon Autopilot is Installed:

- ❑ Turn the trim speed knob to MAX.

- ❑ Avionics switch “ON”.
- ❑ Verify that GPS source is functioning. (Note: Aircraft must be outside to get a GPS fix)
- ❑ Verify that COM radio powers up and can receive and transmit. Check for “Tx” on radio display when activating PTT switches.
- ❑ Verify right and left seat COM PTT function.
- ❑ Verify that intercom powers up and is functioning for both pilot & co-pilot. Two headsets should be plugged in for this test. Check that side tone is present.
- ❑ Verify that transponder powers up.
- ❑ Verify transponder indication on EFIS.
- ❑ Verify ADS-B is functioning.

- ❑ Reference Chapter 9 of the RV-12iS MM to adjust the sound levels within your aircraft.

NOTE: All audio levels are set at the factory to default settings for audio balance.

NOTE (GTR200): EFIS warning and AOA tone levels may be adjusted within the EFIS setup menu. Both of these tones summed together are controlled by the GTR200 Aux 2 input level. Stall Warning tone level is controlled by the GTR200 Aux 1 input level. Music levels are controlled by the GTR200 Music input level.

NOTE (GMA245): EFIS warning and AOA tone levels may be adjusted within the EFIS setup menu. Both of these tones summed together are controlled by the GMA245 Alert 1 input level. Stall Warning tone level is controlled by the GMA245 Aux 1 input level. Music levels are controlled by the GMA245 Entertainment 1 input level.

Within the EFIS setup menu:

- ❑ Check that the Stall Warning is louder than example AOA tones.
- ❑ Check that AOA example tones are louder than example EFIS warnings.
- ❑ Check that XM or Bluetooth music is not louder than Stall Warning, AOA tones or EFIS warnings.

- ❑ Check dimmer control of lighted switches and avionics.
- ❑ Avionics switch “OFF”.

If optional combination Navigation/Strobe lights have been installed:

- ❑ Nav & Strobe switch “NAV”.
- ❑ Verify that only nav and position lights are illuminated - red on left and green on right.
- ❑ Nav & Strobe switch “NAV STROBE”. Verify that both side’s nav and strobe lights come on.
- ❑ Check dimmer function controls the roll bar mounted cabin light.
- ❑ Nav & Strobe switch “OFF”.

If optional single landing light has been installed:
- ❑ Landing light switch “STEADY”.
- ❑ Verify that landing light is on steady.
- ❑ Landing light switch “PULSE”.
- ❑ Verify that landing light pulses on and off.

If optional second landing light has been installed:
- ❑ Landing light switch “PULSE”.
- ❑ Verify that landing lights pulse in synchronized “wig-wag” pattern.

- ❑ Landing light switch “OFF”.

OTHER APPROPRIATE SYSTEMS:

- ❑ Lower canopy and engage latch while sitting in the left seat using your right hand.
- ❑ Verify that canopy can easily be latched and unlatched.
- ❑ Verify that canopy “WARNING” shows on EFIS when unlatched.

- ❑ Master switch "OFF".
- ❑ Remove battery charger.
- ❑ (ULS) Reinstall fuel pump fuse.

LANDING GEAR & BRAKES:

- ❑ Remove main landing gear access covers on bottom of fuselage.
- ❑ Verify that main landing gear attach nuts are properly torqued.
- ❑ Verify that brake system has been filled with MIL-H-5606 (or equivalent) and fluid reservoir is filled to approximately 2/3 – 3/4.
- ❑ Sit in pilot seat and actuate brake pedals several times to take-up clearance in brake calipers then apply force and hold for at least 30 seconds.
- ❑ Verify that pedals feel firm and hold steady position.
- ❑ Verify no leaks at all brake line connections.
- ❑ Verify effectiveness (have a helper try to move the aircraft while holding brakes).
- ❑ Sit in passenger seat and actuate brake pedals several times then apply force and hold.
- ❑ Verify pedal firmness.
- ❑ Verify no fluid leaks.
- ❑ Check tire pressure as specified in the POH.
- ❑ If wheel fairings are installed, verify minimum ½ inch gap between fairing cutouts and tire around entire opening.

Section G1 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G2 – Flight Controls Check

FLIGHT CONTROLS:

- ❑ Remove empennage fairing.
- ❑ Verify that top stabilator cable is attached and safetied.
- ❑ Verify that bottom stabilator cable is attached and safetied.
- ❑ Verify that both rudder cables are attached and safetied.
- ❑ Verify that the trim motor tray is attached and safetied.
- ❑ Verify that at both rudder hinge points (upper and lower), the bolt/nut/washers are properly installed as specified in KAI Section 11iS-02.
- ❑ Verify that at both stabilator hinge points (right and left), the bolt/washers are properly installed as specified in KAI Section 11iS-03.

- ❑ Move the stick full aft and hold firmly against the stop.
- ❑ Verify that the stabilator is in the trailing edge up position.
- ❑ Vary the amount of force on the stick and verify that the stick can move slightly off its stop before the stabilator begins to move.

- ❑ Move the stick full forward and hold firmly against the stop.
- ❑ Verify that the stabilator is in the trailing edge down position.
- ❑ Vary the amount of force on the stick and verify that the stick can move slightly off its stop before the stabilator begins to move.

- ❑ Hold the stick full right while moving from full forward to full aft.
- ❑ Verify smooth movement of the stabilator with no binding and little or no friction.

- ❑ Hold the stick full left while moving from full forward to full aft.
- ❑ Verify smooth movement of the stabilator with no binding and little or no friction.

- ❑ Turn the master switch “ON” and actuate “NOSE UP” side of trim switch until the motor reaches the stop.
  NOTE: this will take several switch flips due to software preventing “runaway trim”
- ❑ Move the stabilator to the full trailing edge (T.E.) up position and measure the tab position.
- ❑ Distance from center of AST (Anti-Servo Tab) T.E. at one outboard tip to the center of adjacent stabilator T.E: _____(nominal distance: 9/16 inch [14.29mm]) See Figure 3.

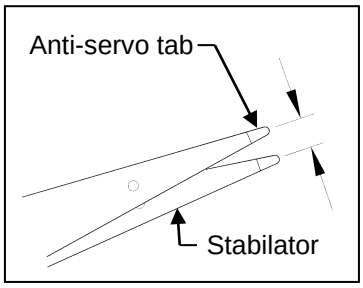

FIGURE 3: AST TAB MEASUREMENT

- ❑ Standing alongside the stabilator, move stabilator from full-up to full-down and check for binding/interference of the anti-servo tab and actuating mechanism.
- ❑ Move the stabilator to the full trailing edge up position and hold it there.
- ❑ Verify that there is at least 1/4 inch [6.3mm] clearance between the bottom of the rudder and the AST pushrod. Reference KAI 11iS-09.

- ❑ Actuate “NOSE DOWN” side of trim switch until limit is reached.
  Move the stabilator to the full trailing edge down position and measure the tab position.
- ❑ Distance from center of AST T.E. to center of stabilator T.E: _____ (nominal distance: 3/8 inch [9.5mm]) See Figure 3.

- ❑ Standing alongside the stabilator, move stabilator from full-up to full-down and check for binding/interference of the anti-servo tab and actuating mechanism.
- ❑ Move the stabilator to the full trailing edge up position and hold it there.
- ❑ Verify that there is at least 1/4 inch [6.3mm] clearance between the bottom of the rudder and the AST pushrod.

- ❑ Actuate trim switch to place the trim in the TAKEOFF position on the EFIS.
  Move the stabilator to the full trailing edge up position and measure the tab position.
- ❑ Distance from center of AST T.E. to center of stabilator T.E: _____ (nominal distance: 2.0 inches [50.8mm]) See Figure 3.

- ❑ Turn the master switch “OFF”.

- ❑ Install the empennage fairing.
- ❑ Verify that there is no interference between the empennage fairing and the stabilator or anti-servo tab pushrod at any point in their full ranges of travel.

Using a 12 inch or 30cm. straightedge, verify that:

- ❑ The rudder skin, anti-servo tab, and stabilator skin are flat between the spar and trailing edge and that there is no pillowing or bulging between ribs. (If necessary, re-shape trailing edge bend using the procedure described in Section 5.7 of the KAI).

- ❑ Ensure the trim tab is in the TAKEOFF position.
- ❑ Move the rudder full left and hold against the stop.
- ❑ Measure distance from bottom of rudder trailing edge to center of anti-servo pushrod with stabilator held in full up position. Distance: _____ inches (nominal distance: 7 1/8 inches [18.1cm] - measured horizontal, 7 5/16±1/8 inches [18.57±.3 cm] - measured diagonally from point-to-point)

- ❑ Move the rudder full right and hold against the stop.
- ❑ Measure distance from bottom of rudder trailing edge to center of anti-servo pushrod with stabilator held in full up position. Distance: _____ inches (nominal distance: 7 1/8 inches [18.1cm] - measured horizontal, 7 5/16±1/8 inches [18.57±.3 cm] - measured diagonally from point-to-point)

While seated in pilot seat, move rudder through its full range of motion.

- ❑ Verify that when the left pedal is pushed, the rudder moves trailing edge left and when the right pedal is pushed, the rudder moves trailing edge right.
- ❑ Verify smooth movement of the rudder from stop-to-stop with no binding and little or no friction.
- ❑ Verify that the left flaperon moves trailing edge up when the stick is moved left and vice versa.

Using a 12 inch or 30 cm. straightedge, verify that:

- ❑ The flaperon skin is flat between the spar and trailing edge and that there is no pillowing or bulging between ribs. (If necessary, re-shape trailing edge bend using the procedure detailed in KAI Section 5.7).

- ❑ Turn the master switch “ON”
- ❑ Calibrate the Flap Position Indicator per the EFIS manual.
- ❑ Cycle flaps through entire range. Verify smooth operation and position readout on EFIS.

- ❑ Place flaps in "retracted" position and have a helper hold the left flaperon trailing edge in line with tip trailing edge (in trail) position.
- ❑ Verify right flaperon trailing edge is 1/4 inch [6.3mm] to 1/2 inch [12.6 mm] below trail position.
- ❑ Verify that when a 10lb [4.5kg] upward load is applied to the trailing edge of the right flaperon, the trailing edge does not flex above trail position more than 1/2 inch [12.6 mm].

- ❑ Move stick full aft and hold against the aft stop while moving the stick left stop-to-right stop.
- ❑ Verify smooth operation, no interference or binding, and a minimum of 1/8 inch [3.17mm] gap between each flaperon (top and bottom skins) and the fuselage skin when the flaperon is deflected to its highest trailing edge up position. If the flaperon gap is below minimum, mark the trim line for proper gap and use aluminum shears and a file to trim the excess.

- ❑ Move stick full forward and hold against the forward stop while moving the stick left stop-to-right stop.
- ❑ Verify smooth operation, no interference or binding, and a minimum of 1/8 inch [3.17mm] gap between the flaperon and the fuselage skin when the flaperon is deflected to its highest up position. If the flaperon gap is below minimum, use aluminum shears and a file to trim the excess.

- ❑ Place flaps in "50%" position.
- ❑ Move stick full aft and hold against the aft stop while moving the stick left stop-to-right stop. Verify smooth operation, no interference or binding.
- ❑ Move stick full forward and hold against the forward stop while moving the stick from left stop-to-right stop. Verify smooth operation, no interference or binding.

- ❑ Place flaps in "full" position.
- ❑ Move stick full aft and hold against the aft stop while moving the stick from left stop-to-right stop. Verify smooth operation, no interference or binding.
- ❑ Move stick full forward and hold against the forward stop while moving the stick from left stop-to-right stop. Verify smooth operation, no interference or binding.

- ❑ Place flaps in the “retracted” position.
- ❑ Turn the master switch “OFF”.

- ❑ Verify that the stabilator cable turnbuckles have safety pins installed.
- ❑ Verify that the stabilator cable tension is adjusted such that when the stick is "pulsed" fore and aft, the cables do not slap against the aircraft structure.

Section G2 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G3 - Seats and Safety Belts

OCCUPANT RESTRAINT:

-Pilot side Lap Belt:

- ❑ Verify security of attachment, 2 places, left and right.
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

-Pilot side Shoulder Belt:

- ❑ Verify security of attachment.
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

-Pilot side Crotch Belt:

- ❑ Verify security of attachment.
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

-Passenger side Lap Belt:

- ❑ Verify security of attachment, 2 places, left and right
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

-Passenger side Shoulder Belt:

- ❑ Verify security of attachment.
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

-Passenger side Crotch Belt:

- ❑ Verify security of attachment.
- ❑ Verify no visual defects (signs of fraying, wear, loose stitching, etc)

Seat backs and cushions:

- ❑ Verify both left and right seat backs are in full forward positions with the pins secured in the brackets and the upper brace restrained in the full forward slot.
- ❑ Verify both left and right seat cushions are in place and fit well to seat back and cabin floor.
- ❑ Verify that at any point in sticks' range of motion there is no interference with seat cushion.
- ❑ Adjust seat backs to desired seating position and verify proper latching.

Occupant restraint latching/unlatching:

- ❑ Sit in the seat, latch and adjust the belts such that the lap belt is low on hips, the crotch belt is adjusted such that restraint buckle cannot be pulled higher than occupant's navel, and the shoulder belt is adjusted with minimum amount of slack such that all controls can be reached and operated.
- ❑ Verify that pilot side restraint system stays latched and adjusted while throwing body weight alternately against shoulder belts then seatback. When unbuckling check that handle must be pulled beyond 45° to release.
- ❑ Verify that passenger side restraint system stays latched and adjusted while throwing body weight alternately against shoulder belts then seatback. When unbuckling check that handle must be pulled beyond 45° to release.

Section G3 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G4 - Engine Check

ENGINE:

- ❑ Remove cowling, upper and lower.
- ❑ Verify proper engine attachment.
- ❑ Verify proper exhaust system attachment.

Throttle control:

- ❑ Verify proper attachment.

- ❑ (iS) Verify proper operation through the entire range (observe the throttle arm while having a helper move the throttle lever from the cabin).
- ❑ (iS) Verify the Eco Stop is set at the transition from 97% to 98% throttle.

- ❑ (ULS) Verify proper operation through the entire range (observe carburetors while having a helper operate the throttle lever from the cabin)
- ❑ (ULS) Check that throttle arms reach the Wide Open Stop concurrently and that there is no interference with other systems.

(ULS) Choke control:

- ❑ Verify proper attachment.
- ❑ Verify proper operation (observe carburetors while having a helper operate the choke control from the cabin).

Cabin heat control:

- ❑ Verify proper attachment.
- ❑ Verify proper operation of each heat door (observe cabin heat doors while operating the heater control knobs from fully open to fully closed).
- ❑ Verify each heat door rests against its seat when the heater control knob is fully closed.

- ❑ Fill cooling system in accordance with Rotax SI-912-016 latest revision (use of standard coolant is recommended). See KAI 50iS/U-02 to remove the AN913-3D pipe plug that was temporarily installed. Ensure that the radiator fills to fill plug height before tightening and safetying the plug. Observe that threads do not get wet before inserting the plug. Check for leaks.

- ❑ Fill oil system in accordance with Rotax SI-912-018 (latest revision) procedure.
- ❑ Add approximately 4 gallons of fuel to the tank and check for leaks.

(ULS) Fuel System and Gascolator Testing:

- ❑ Master Switch “ON”
- ❑ Move fuel valve to “ON” position.
- ❑ Listen at fuel filler neck for fuel splashing back from the return system.
- ❑ Master switch "OFF", Fuel Valve “OFF”. Verify no fuel leaks.
- ❑ Disconnect fuel line at Engine Fuel Pump inlet fitting.
- ❑ Feed fuel hose into a fuel container that will show an internal fuel level of 1 gallon. Fuel container should be at fuel pump height. Observe fire and ventilation safety.
- ❑ Charge battery to full. Voltage should read at least 12.7v when the charger is removed.
- ❑ Have a helper turn Master Switch "ON", reduce load on the electrical system by turning off strobes and nav lights, dimming screens, etc.
- ❑ Fuel valve "ON".
- ❑ Record time from Valve “ON” until 1 gallon has emptied into container.

Time to pump one gallon: _____ (Max Time: 180 seconds)

- ❑ Master Switch “OFF”.
- ❑ Re-connect fuel line to fuel pump.

(iS) Fuel System Testing:

- ❑ Remove the fuel supply hose from the RH fuel manifold on the engine.
- ❑ Feed fuel hose into a fuel container that will show an internal fuel level of 1 gallon. Fuel container should be at fuel pump height. Observe fire and ventilation safety.
- ❑ Master Switch “ON”
- ❑ “Fuel Pump 1” switch “ON”. Pump at least one gallon of fuel through the fuel system into a clean fuel container.
- ❑ “Fuel Pump 1” switch “OFF”
- ❑ Check for debris in the container. If debris is observed filter fuel and return it to the fuel tank then repeat test until fuel comes out clean.
- ❑ “Fuel Pump 2” switch “ON”. Pump at least one gallon of fuel through the fuel system into a clean fuel container.
- ❑ “Fuel Pump 2” switch “OFF”
- ❑ Check for debris in the container. If debris is observed filter fuel and return it to the fuel tank then repeat test until fuel comes out clean.
- ❑ Reconnect the fuel line.
- ❑ Run fuel pumps for approximately 30 seconds each individually, then both at once, and record system pressure:
  - Fuel Pump 1 switch:_____
  - Fuel Pump 2 switch:_____
  - Both:_____
- ❑ Master Switch “OFF”.
- ❑ Check entire fuel system for leaks.

- ❑ Remove lower spark plug from each cylinder.

Propeller and spinner installation:

- ❑ Remove spinner.
- ❑ Check prop blade pitch setting (blades both at same pitch angle). See KAI Section 47iS/U.
- ❑ Check prop bolt torque.
- ❑ Check prop tracking (difference between blades must be less than 1/8 inch (3.17mm)).
- ❑ Re-install spinner.
- ❑ Check pitot tube tracking (max difference must be less than 1/16 inch (1.6mm)).

- ❑ Master Switch “ON”.
- ❑ Confirm Ignition Lane A and B – “OFF”
- ❑ Unlatch one wing pin at a time and verify red warning light comes on.
- ❑ Verify starter circuit is disabled while red warning light is on.
- ❑ While red warning light is on, check that holding the spar pin warning light button enables starter circuit.
- ❑ Master Switch “OFF”.

- ❑ Install lower spark plugs in all cylinders.
- ❑ Install cowl.

Section G4 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G5 - Pitot, Static, and AOA System Leak Check

❑ Move the flight controls through all extents multiple times to confirm there is no
Move the flight controls through all extents multiple times to confirm there is no interference between any tubing or wires and any flight controls or the flaperon linkage. Inspect for interference with the flaps in all positions.

NOTE: When performing any AOA, Static or Pitot system pressure test on a Dynon SkyView system it is required to be at Software Version 15.0.4 (or greater) and all testing must be performed in the SETUP MENU > HARDWARE CALIBRATION > ADAHRS CALIBRATION > PITOT/STATIC TEST MODE.

CAUTION: During initial AOA system installation testing the AOA tubing will be temporally connected to the ADAHRS Pitot port. Do not fly the airplane without connecting all AOA, Pitot and Static tubing to the proper ADAHRS ports.

This test must be used to test AOA system plumbing integrity during initial AOA system installation.

- ❑ Install both wings and engage both spar pins.
- ❑ Disconnect the pitot tubing from the ADAHRS pitot fitting, connect the AOA tubing to the ADAHRS pitot fitting.
- ❑ Using a 35cc syringe, push the plunger in to 7.5cc, use modeling clay to hook-up the syringe and a vacuum hose to the AOA port.

Turn on the EFIS (see Dynon setup NOTE above), use the syringe to slowly and carefully push air into the AOA port. Look for an airspeed indication on the EFIS, push-in the syringe until 130 kt indicates.

Start stopwatch when EFIS indicates 130 kts and note the airspeed _____ kts after one minute.

❑ Move the left wing tip back and forth, as per the RV-12 Maintenance Manual Chapter 3 Rear Spar Doubler section, while performing the AOA system leak test to verify AOA system integrity.

❑ Maximum allowable AOA system leak rate is 10 kts in one minute.

NOTE: If the AOA system does not hold test pressure for the required time inspect the modeling clay to wing seal before inspecting other AOA system components. Inspect and repair or replace any faulty AOA system components as necessary. Re-test AOA system plumbing integrity any time the system is "opened".

❑ Reattach the pitot and AOA tubes to the proper ADAHRS port fittings.

NOTE: The AOA system plumbing must pass this leak test during every inspection.

❑ Using 35cc syringe or equivalent, push plunger in to 7.5cc, hook-up syringe & vacuum hose to pitot tube, turn-on EFIS, use syringe to slowly and carefully push air into the pitot tube, look for airspeed indication on EFIS, push-in syringe until 130 kts indicates then stop pushing-in.

Start stopwatch when EFIS indicates 120 kts and note the airspeed _____ kts after one minute. (Maximum allowable pitot system leak rate is 10 kt in one minute.)

- ❑ Note current altitude indication:_____

- ❑ Tape-over one of the static ports with electrical tape, fully push-in syringe plunger and use modeling clay to hook-up syringe & vacuum hose to the other static port, use syringe to draw-out air from static system. Look for altitude indication on EFIS, draw syringe out until 1,200 ft above current altitude indicates, stop drawing-out.

Start stopwatch when EFIS indicates 1000 ft above field elevation.
Note the altitude: _____ ft after one minute.

- ❑ Maximum allowable static system leak rate is 100 ft in one minute.

NOTE: If leakage is excessive, inspect the modeling clay seal before inspecting other static system components. Inspect and repair or replace any faulty static system components as necessary

Configure your EFIS to display AOA information using the Dynon or Garmin AOA setup instructions, as necessary. Also refer to the Van's Aircraft downloadable "Read Me" file that pertains to your EFIS system for additional information.

AOA calibration must be done in flight, take all necessary precautions.

Section G5 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G6 - Engine Ground Run (Note: This section must be done with the aircraft outside.)

- ❑ Confirm at least 2 gallons of fuel in the tank.
- ❑ Chock main wheels, tie-down tail.
- ❑ Master switch "ON".

Check EFIS for:

- ❑ Ammeter functioning and showing discharge.
- ❑ Voltmeter functioning and showing more than 12.0 volts.
- ❑ (iS) Fuel pressure indication = zero.
- ❑ (ULS) Fuel pressure indication in the “green range”.

- ❑ Start engine per relevant POH checklist.

Check EFIS for:

- ❑ Tachometer function.
- ❑ Oil pressure functioning and showing pressure (oil pressure may take up to 10 seconds to acquire).

WARNING: If no oil pressure is shown within 10 seconds, shut down the engine immediately.

- ❑ Ammeter functioning and showing charge.
- ❑ Voltmeter functioning and showing 13 volts or higher.
- ❑ (ULS) CHT functioning (both cylinders).
- ❑ (iS) Cylinder coolant temps indicating.

EGT functioning:

- ❑ (ULS) Left and Right.
- ❑ (iS) All four cylinders.

- ❑ (iS) Positive fuel flow.

Once oil temperature exceeds 122° F [50° C]:

- ❑ (ULS) Perform carburetor synchronization procedure as called-out in Section 12 of the RV-12iS Maintenance Manual.
- ❑ (ULS) Run-up to 4000 RPM then check each ignition per the relevant POH checklist.

- ❑ (iS) Run-up to 4000 RPM then check each Lane per the relevant POH checklist.

- ❑ At 4000 RPM latch and unlatch the canopy to verify audio and visual of canopy latch open. Move canopy handle back and forth in the detent within the canopy latch block to insure that no condition exists in which the canopy is latched but the switch shows the canopy is open.
- ❑ Reduce to 2500 RPM, latch and unlatch canopy and verify no warning is given.
- ❑ (iS) Check fuel pump function and fuel pressure per POH Section 4.7 BEFORE TAKEOFF RUN UP.
- ❑ Check heater control operation.
- ❑ Throttle to idle, note RPM, smoothness of run.

Once oil temperature exceeds 165° F [74° C]:

- ❑ Check tachometer indication, engine idle at 1550-1650 RPM
- ❑ Verify functionality of throttle springs. (See RV-12iS Maintenance Manual Section 12)

- ❑ Shut down aircraft.
- ❑ Remove lower cowl.

Check for:

- ❑ Oil, coolant, and fuel leaks
- ❑ Check oil level.
  WARNING: Only check coolant expansion tank level when engine has cooled down (CHT below 110 degrees).
- ❑ Anything missing or loose (nuts, wires, sensor connections, etc)
- ❑ Remove remaining fuel by disconnecting fuel line as previously done in Section G4 Fuel System Testing. Run electric fuel pump until pump sound changes then reattach fuel line.
- ❑ (ULS) remove Gascolator bowl. Note presence of any debris in gascolator bowl and clean screen then re-install gascolator bowl and safety.
- ❑ (ULS) Remove carburetor bowls and check for debris.

- ❑ Install Cowl.

- ❑ Dynamically balance the propeller according to the manufacturer's instructions. (If balance weights are needed, drill holes in the appropriate locations on the rear spinner bulkhead and install the weights there.)
  NOTE: If the propeller is significantly out of balance, the accuracy of the AHRS and the lifetime of other components can be decreased.

Section G6 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G7 - Weight and Balance

❑ Complete the weight and balance procedure found in Chapter 1 of the RV-12iS Maintenance Manual.

Section G7 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G8 - Fuel System Calibration

- ❑ Roll aircraft onto 1 inch (2.5 cm) blocks under main wheels and chock wheels. Check the canopy decks for level and shim nose wheel as required.
- ❑ Master switch “ON”.
- ❑ Record “empty” sensor value:_____, add 2.1 gallons for first 2 gallon interval and record fuel
- ❑ Add fuel incrementally and map quantity indication.

  Note: sensor value will stop changing at just over 16 gallons due to design limits of sensor actuation range.

total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____
total:____	sensor value:_____	visual gauge:_____

- ❑ Calibrate fuel quantity indication according to EFIS manual.

Section G8 checks completed by:

_____ _____
Printed Name/Title Aircraft Serial Number

_____ _____
Signature Date

Section G9 - Placards Check

- ❑ Verify that N number is on outside of aircraft, 2 places.
- ❑ Verify the N number size meets 14 CFR 45.29 requirements. (S-LSA)
  (12 in. high, 8 in. wide – except:
  "1" – 2 in. wide
  "W" & "M" – 12 in wide)
- ❑ Verify that stainless steel data plate is on outside of aircraft.
- ❑ Verify that N number is on instrument panel.
- ❑ Verify that EXPERIMENTAL (for ELSA) or LIGHT-SPORT (for SLSA) placard is on baggage bulkhead.
- ❑ Verify that instrument panel switches and fuses are all labeled.
- ❑ Verify that "OPEN" canopy latch placard is on outside of rear window.
- ❑ Verify that Fuel type and capacity placard is on outside near fuel cap.
- ❑ Verify that THROTTLE is ahead of throttle control and OPEN is oriented forward.
- ❑ Verify that CABIN HEAT is near cabin heat knobs and PULL ON is on knob ends.
- ❑ (ULS) Verify that PULL ON is below choke control.
- ❑ (ULS) Verify that CHOKE is on choke knob end.
- ❑ Verify that fuel valve ON/OFF placard is adjacent to fuel valve.
- ❑ Verify BAGGAGE CAPACITY MAXIMUM 75 lbs (22.68kg) is on baggage bulkhead.
- ❑ Verify that NO PUSH placards (2 places) are on anti-servo tab.
- ❑ Verify that AUTOPILOT DISCONNECT is adjacent to AP disconnect switch. (If autopilot is installed)
- ❑ Verify that PASSENGER WARNING placard is on instrument panel.
- ❑ Verify that 300 LB WEIGHT LIMIT PER SEAT placard is between seats.
- ❑ Verify that POWER OUTLET placard is adjacent to the 5V 5A Max USB power outlet.
- ❑ Verify that ELT placards on instrument panel near ELT switch and on access panel covering ELT.
- ❑ Verify that FLAPS UP/DOWN placards are near flap switch.

Section G9 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section G10 - Preflight Inspection

Verify that the following required documentation is on board:

- ❑ All applicable SA, SD, SB, Notifications, Service Letters and Change notices prior to the issuance of any Airworthiness Certificate.
- ❑ Airworthiness certificate (must be visible at the entrance of the aircraft).
- ❑ Operating limitations.
- ❑ Registration certificate.
- ❑ Pilot's Operating Handbook.
- ❑ Completed & signed Weight and Balance worksheet.

- ❑ Perform a complete Preflight inspection as called-out in Section 4 of the Pilot Operating Handbook.
- ❑ All visible surfaces are free of deformation, distortion, or other evidence of failure or damage.
- ❑ All visible connections and fittings are securely attached.
- ❑ All Ground Checks G1-G9 completed and discrepancies resolved.
- ❑ Verify aircraft insurance is active if applicable.
- ❑ Record of type of authorization issued to conduct the flight testing.

_____ (Example: 8130-7 Special Flight Permit)

Section G10 checks completed by:

_____	_____
Printed Name/Title	Aircraft Serial Number
_____	_____
Signature	Date

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Section T1 - Taxi Tests.

- ❑ Start engine and verify proper engine and systems operation following POH procedures.

CAUTION: Rapid application of throttle or high RPM may lift canopy open

CAUTION: RPM should remain below 2500 RPM until the oil temp has risen above 122 ºF. For iS engines, a short duration above 2500 RPM (up to 5 seconds) is allowable to engage generator (see POH checklist).

- ❑ Verify that brakes can hold the aircraft stationary with power at up to 2500 RPM.
- ❑ Taxi slowly and make sure that brakes are functioning and that the aircraft can easily be brought to a full stop.
- ❑ Taxi slowly and verify that the aircraft tracks straight with rudder held straight and without use of brakes. (This must be done on a level taxiway and with less than 5 knots wind)
- ❑ Verify that, when taxiing at 15 kt or faster, aircraft can be steered using rudder only and no brakes.
- ❑ Verify that with one brake locked, the aircraft can be pivoted or spun 360 degrees on one wheel. Perform this task in both directions.
- ❑ Latch Canopy.
- ❑ Once oil temperature has reached at least 122 degrees F [50ºC], perform a 4000 RPM run-up and verify that the brakes can hold the aircraft stationary.
- ❑ Verify that the aircraft can be held stationary with the engine at full throttle. If unable check again after brake conditioning procedure and add ballast weight if necessary.
- ❑ Taxi at progressively higher speeds up to but not exceeding 25 knots. At each speed, verify that aircraft can be accurately steered using only rudder and that the aircraft can be rapidly brought to a stop while tracking in a straight line. Pay attention to the amount of rudder input necessary to counteract engine torque and to keep the airplane straight on the runway. Watch out for rapid applications of throttle at low speeds.
- ❑ Perform brake pad conditioning per Brake Manufacturer instructions then let brakes cool for five minutes.
- ❑ Perform magnetometer calibration according to EFIS manual.
- ❑ Shut down engine per following POH procedures.
- ❑ After shut down move the aircraft approximately 3 aircraft lengths by hand to verify that both brakes are fully releasing and are not dragging.

- ❑ Hold the stall warning vane in the “ON” position. This can be accomplished by placing an ATC fuse beneath the vane or by using tape.
- ❑ Re-start engine and verify proper engine and systems operation following POH procedures.
- ❑ Increase the RPM to 4000 RPM.
- ❑ Check that the Stall Warning audio tone level is loud enough to function as a warning with the engine running and is louder than all other audio inputs.
- ❑ After shut down make any final adjustments to audio levels.

Section T1 checks completed by:

Printed Name/Title	Aircraft Serial Number
Signature	Date

Section F0 – Flight Test Procedure - Overview

The flight test procedure has been developed to verify that:

- The aircraft is fully functional.
- The aircraft is in proper trim.
- Calibrations and adjustments, if required, have been made.
- The flight performance matches that given in the POH.
- The small variables inherent between individual aircraft do not adversely affect handling qualities.

Flight Test Pilot Requirements:
Test flying a new aircraft is a stressful and strenuous role. At a minimum, an RV-12iS test pilot must be current, proficient in a similar LSA with a Rotax 912 engine, and familiar with all aircraft systems and procedures as well as the airport and surrounding area in which the flight testing will be conducted.

FAA Advisory Circular AC 90-89B, Section 4 has good guidelines for test pilot requirements and recommendations for conducting early test flights. Read and understand this information prior to conducting your flight testing.

Conforming versus Non-conforming Aircraft:
Aircraft of proven design (such as the RV-12iS) which have been built in conformity with the design standard usually pose few challenges to their test pilots even in the early hours of flight. However, this ideal must not be assumed therefore the “test” pilot must be prepared for any irregularity which may occur.

Seemingly small or insignificant "modifications" to the proven and tested design standard should not be taken lightly as they often have far reaching implications to flying qualities, structural strength, and/or performance. Thus an RV-12iS with a configuration not conforming to the design standard must be tested as if it were a completely new design. The procedure given in this document does not even begin to address what is required in that situation.

Flight Test Weather Conditions:
The test flying of your RV-12iS should be attempted only under the best possible conditions. The best time to fly is typically early morning or late afternoon. The wind should be calm or light and directly down the runway.

Performance data recordings and handling qualities tests flown in windy or turbulent weather are often so inaccurate as to be useless. Be patient and pick your weather carefully.

Ballast:
The recommended takeoff weight for solo flight testing is 1050lb [476.27kg]. Depending upon the empty weight of the aircraft and the weight of the test pilot, it may be necessary to carry some sort of ballast to get the total weight up to 1050 lb [476.27kg]. Ballast must be properly restrained so as to stay in place during the entire flight. Unrestrained ballast is extremely dangerous because it can foul the controls and will, in the event of a sudden deceleration, become a projectile.

If ballast is needed, a gasoline container with molded-in handles filled with water (and so labeled) may be secured in the passenger seat using the lap, crotch, and shoulder belts. Fresh water weighs 8.34lbs/gallon [1 kg/L]. Except for the case of a very light aircraft and pilot weighing less than 150 lb [68kg] a single 5 gallon (or 20 liter) container of water will be sufficient to bring the total weight of aircraft, fuel, pilot, and ballast to 1050 lb [476.27kg].

NOTE: FAA Regulations allow an additional qualified pilot during initial flight testing and in such a circumstance it is permissible to deviate from 1050lb. See Advisory Circular 90-116 for further information.

Data Retrieval from EFIS:
While the required flight test data gathering can be done by hand, it will be much simpler if the data for each flight is retrieved from the EFIS by downloading onto a laptop computer and the post flight data reduction done using Excel. An Excel "RV-12iS Flight Test Data" template can be downloaded from the Downloads page of the Van's Aircraft website which can be used to simplify entering and archiving flight test data.

Post-Flight Activities:
Between each flight, identify and correct any discrepancies noted. If necessary, repeat flight test card sections until the aircraft is adjusted correctly before continuing on to the next flight test card.

After each flight, download and review the data from the EFIS. Make any necessary adjustments and calibrations to the aircraft and systems. Review the data and notes from the previous flight and become familiar with the tasks to be performed on the next flight.

Directional (yaw) trim adjustment:
An off-center skid ball is common for many new airplanes. Small trim adjustments should be made so that when at cruise speed the airplane flies straight and true without stick or rudder input.

To test directional trim, establish and hold level flight. Remove your feet from the rudder pedals. If the skid ball does not remain centered, rudder trim will be needed. Apply rudder as necessary to center the ball and determine whether "right or left" trim will be needed.

Add bend angle to the trim tab for right rudder effect, straighten for left trim. Fly the airplane to gauge the result. It may take several flights to determine the exact angle.

Lateral (roll) trim adjustment:
A roll tendency that increases with speed is common for many new airplanes. Small trim adjustments should be made so that when at cruise speed the airplane flies straight and true without stick or rudder input.

To test roll trim, establish and hold level flight and center the skid ball with the rudder (if the aircraft is not in directional trim). Release the stick and note any roll tendency or "heavy wing".

The structure of the RV-12iS flaperons allows roll trim to be varied through alteration of the flaperon trailing edge bend radius. Experience has shown that roll trim can be achieved by decreasing or "tightening" the trailing edge radius of the flaperon on the "light" wing - the one coming up as the airplane rolls. Squeezing the trailing edge tighter (with just your fingers) along the length of the flaperon will have an effect. Small variations in trailing edge shape can have noticeable affects on control, and the skins will crack if squeezed too tight.

Fly the airplane to gauge the result. Several such trial-and-error attempts may be needed to achieve the desired results. If an over-correction occurs, it can be corrected in two ways:

- The opposite aileron's trailing edge can be reduced slightly in the above manner, providing that the aileron control forces have not increased too much. Stick force increases as the trailing edge radius decreases.
- A trailing edge radius which has been "tightened" too much can be expanded as shown in the KAI, Section 5.7.

Stall Testing:
Approach each stall slowly with a deceleration rate of not more than 1 knot per second while holding the wings level and keeping the ball centered. Allow the speed to bleed off until you feel a slight buffet. Note the airspeed and recover with a smooth forward movement of the stick as power is added.

Stall Warning Adjustment:
The stall warning tone should activate 7 kt (±2 kt) prior to the actual stall break. If the warning comes on too soon then the vane should be adjusted down slightly. If the warning comes on too close to the stall, then the vane should be adjusted leading edge upward.

(iS Only) Eco Stop Adjustment:
The Rotax 912iS engine offers an “Eco” mode which results in significantly reduced fuel consumption at a cruise power setting. The RV-12iS (when equipped with an iS engine) has an adjustable “Eco Stop” feature in the throttle quadrant to help the pilot quickly find the upper throttle limit of Eco mode.

To test the Eco Stop, establish level flight at a density altitude of 7500 ft. Advance the throttle to the Eco Stop and allow the airspeed to stabilize while maintaining altitude. Check the EFIS indication to ensure the engine is operating in “Eco” mode.

If the engine is operating above the “Eco” mode, adjust the Eco Stop to a lower throttle position and retest. Small adjustments to the Eco Stop position can have a noticeable effect.

Fuel Flow Calibration:
(iS) Fuel flow calculations are done within the Engine Control Unit and have no means for user calibration. It is still a good idea to check this information against actual fuel used to gain familiarity with the system.

E-LSA RV-12iS FLIGHT TEST PROCEDURE
SEQUENCE OF FLIGHTS & TASK OVERVIEW

FLIGHT #	TASKS
1	Systems Check-out Initial Flying Qualities Evaluation Trim Evaluation Flap Extension / Retraction Slow Flight Flying Qualities Evaluation Stall Warning Evaluation Flight Envelope Expansion
2	1050 lb Take-off distance measurement 1050 lb Vy climb performance measurement Balked Landing / Throttle Response check (Optional) AP Servo Calibration Cruise speed/Airspeed calibration check AOA Calibration Flight Envelope Expansion
3	1050 lb Vx climb performance measurement Stall Evaulation Slow Flight / Airspeed Calibration Check Eco Mode setting check Flight Envelope Expansion
4	Cruise speed/Airspeed calibration check EFIS Pitch Offset adjustment Slow Flight / Airspeed Calibration check

NOTE: For safety, where possible it is recommended that data recording be accomplished by extracting data from EFIS data log. This allows the pilot to focus on flying the aircraft while not being distracted when attempting to hand write data.

DATE:	____-____-____	**BALLAST WEIGHT:** _____	
PILOT:	_____	**PILOT WEIGHT:** _____	
TIME END:	___:___	**FUEL END:** _____ **(gauge)**	_____ **(totalizer)**
TIME BEGIN:	___:___	**FUEL BEGIN:** _____ **(gauge)**	_____ **(totalizer)**
OAT on ground END: _____		**BARO PRESSURE END:** _____	
OAT on ground BEGIN: _____		**BARO PRESSURE BEGIN:** _____	
LOCATION: _____			
SURFACE WIND, END: _____@_____			
SURFACE WIND, BEGIN: _____@_____			
# LANDINGS: _____			

ACCELERATION LIMITS:	**2g (flaps retracted)**
	1.5g (flaps extended ½ or full)
AIRSPEED LIMITS:	**120kt IAS with flaps up**
	65kt IAS with flaps ½ or full

PRE-FLIGHT PREPARATION:

Set EFIS data log rate to 4 hertz.

(Optional): Ensure Garmin ESP is disabled in the G3X EFIS setup menu.

Aircraft load-out: Pilot plus 10 to 14 gallons fuel plus zero ballast.

FLIGHT PROCEDURE:

Zero flap take-off

Accelerate to 75 kt IAS

Climb at 75 kt IAS until >3,000 ft AGL remaining within gliding distance of runway but not further than 5 nm from runway.

While remaining within 5 nm of runway, level-off and set throttle for 4500 to 5000 RPM and trim for hands-off flight.

FLIGHT PROCEDURE (continued):

Systems Checkout:

Engine Indications:

- ❑ Oil Pressure indicating and within limits: _____
- ❑ Oil temperature indicating and within limits: _____
- ❑ Cylinder Head Temperature L indicating and within limits: _____
- ❑ Cylinder Head Temperature R indicating and within limits: _____
- ❑ (ULS) Exhaust Gas Temperature L & R indicating and within limits: _____
- ❑ (iS) Exhaust Gas Temperatures indicating and within limits:
  1 _____ 2 _____ 3 _____ 4 _____
- ❑ Fuel Pressure indicating and within limits: _____
- ❑ (iS) Fuel Flow indicating a reasonable value: _____
- ❑ All voltages indicating and within limits: _____
- ❑ Amperage indicating and within limits: _____

Engine Power Output:

- ❑ RPM appropriate during various phases of flight _____
- ❑ No unusual vibrations, noises, etc. _____
- ❑ No fuel or exhaust smell in cockpit _____

EFIS Indications:

- ❑ Airspeed _____
- ❑ Altitude _____
- ❑ Slip/Skid indicator - ball moves opposite direction of rudder input _____
- ❑ Attitude _____
- ❑ Outside Air Temperature _____

Avionics:

- ❑ Comm radio functionality _____
- ❑ GPS functionality _____
- ❑ Intercom (Check for side tone) _____
- ❑ Transponder _____

Initial Flying Qualities Evaluation:

Control Response appropriate?

- ❑ Pitch _____
- ❑ Roll _____
- ❑ Yaw _____

Control Forces appropriate?

- ❑ Pitch _____
- ❑ Roll _____
- ❑ Yaw _____

FLIGHT PROCEDURE (continued):

Trim Evaluation:

Pitch -

- ❑ Sufficient Authority _____
- ❑ Motor speed acceptable during all phases of flight _____

Yaw -

- ❑ Slip/skid ball centered during cruise with feet off rudder pedals _____

Roll -

- ❑ No tendency to roll with slip/skid ball centered (hold rudder if/as required) and hand off stick. _____

Flap extension/retraction:

Retard throttle and trim for level flight (or slight climb) at 65 kt.

Clean to ½ flaps -

- ❑ Note amount of pitch trim change required _____
- ❑ Note amount of attitude change _____
- ❑ Note amount of roll trim change _____
- ❑ Note any controllability problems _____

½ flaps to full flaps -

- ❑ Note amount of pitch trim change required _____
- ❑ Note amount of attitude change _____
- ❑ Note amount of roll trim change _____
- ❑ Note any controllability problems _____

Full flaps to ½ flaps

- ❑ Note amount of pitch trim change required _____
- ❑ Note amount of attitude change _____
- ❑ Note amount of roll trim change _____
- ❑ Note any controllability problems _____

½ flaps to clean

- ❑ Note amount of pitch trim change required _____
- ❑ Note amount of attitude change _____
- ❑ Note amount and direction of roll trim change _____
- ❑ Note any controllability problems _____

FLIGHT PROCEDURE (continued):

Slow Flight Flying Qualities Evaluation:

Flaps up at 58 kt (1.3 Vs) and power set to maintain level flight
- ❑ Straight & level _____
- ❑ 30° bank turn left/right _____

Flaps ½ at 56 kt (1.3 Vs1) and power set to maintain level flight
- ❑ Straight & level _____
- ❑ 30° bank turn left/right _____

Flaps full at 53 kt (1.3 Vs0) and power set to maintain level flight
- ❑ Straight & level _____
- ❑ 30° bank turn left/right _____

Control Response appropriate?
- ❑ Pitch _____
- ❑ Roll _____
- ❑ Yaw _____

Control Forces appropriate?
- ❑ Pitch _____
- ❑ Roll _____
- ❑ Yaw _____

Stall Warning Evaluation:

Power Off w/immediate recovery (wings level & ball centered; no deep stalls or aggravated stalls)
Flaps up (Vs)
- ❑ Note indicator reading at onset of buffeting _____
- ❑ Note indicator reading when warning buzzer activates _____
- ❑ Note indicator reading at break _____
- ❑ Note rolling tendency (direction and amount) _____

Flaps ½ (Vs1)
- ❑ Note indicator reading at onset of buffeting _____
- ❑ Note indicator reading when warning buzzer activates _____
- ❑ Note indicator reading at break _____
- ❑ Note rolling tendency (direction and amount) _____

Flaps full (Vs0)
- ❑ Note indicator reading at onset of buffeting _____
- ❑ Note indicator reading when warning buzzer activates _____
- ❑ Note indicator reading at break _____
- ❑ Note rolling tendency (direction and amount) _____

FLIGHT PROCEDURE (continued):

Flight Envelope Expansion:

Retract flaps, re-trim and set power for approx 500 ft/min descent to traffic pattern altitude. During descent, allow speed to reach **120 kts IAS** and perform easy maneuvers

- ❑ Verify no unusual flying qualities or other unexpected behavior.

Landing:

Power-off approach at minimum 55 kt with flaps as required for glide path control.

- ❑ Verify proper operation of brakes and verify proper ground handling characteristics
- ❑ Before shut-down - throttle to idle and verify RPM is within range called-out in Section G6

Post flight activities:

- ❑ Adjust rudder trim (if required) _____
- ❑ Adjust roll trim (if required) _____
- ❑ Adjust stall warning vane (if required) _____
- ❑ Download EFIS data, archive file _____
- ❑ Remove cowl and inspect engine _____
- ❑ Adjust idle speed to be within range called-out in Section G6 (if required) _____
- ❑ Correct any engine issues (leaks, high temps, etc.) _____
  _____
  _____
- ❑ Correct any airframe system issues (non-functional equipment, etc.) _____
  _____
  _____
- ❑ Fill fuel tank. Amount of fuel added: _____

Section F1 Flight Test completed by:

_____
Printed Name/Title

_____ _____
Signature Date

_____
Aircraft Serial Number

Type of authorization issued to conduct the flight testing.

_____
(Example: FAA 8130-7 Special Flight Permit)

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Section F2 - Flight Test Card - Flight #2 **Aircraft Registration:_____**

DATE: ____-____-____	**BALLAST WEIGHT:** _____
PILOT: _____	**PILOT WEIGHT:** _____
TIME END: ___:___	**FUEL END:** _____ **(gauge)** _____ **(totalizer)**
TIME BEGIN: ___:___	**FUEL BEGIN:** _____ **(gauge)** _____ **(totalizer)**
OAT on ground END: _____	**BARO PRESSURE END:** _____
OAT on ground BEGIN: _____	**BARO PRESSURE BEGIN:** _____

LOCATION: _____

SURFACE WIND, END: _____@_____

SURFACE WIND, BEGIN: _____@_____

 # LANDINGS: _____

ACCELERATION LIMITS:	**3g (flaps retracted)**
	2g (flaps extended ½ or full)
AIRSPEED LIMITS:	**130 kts TAS with flaps up**
	82 kt IAS with flaps ½ or full

PRE-FLIGHT PREPARATION:

Set EFIS data log rate to 4 hertz. (Erase old flight data within EFIS, if downloaded)

Familiarization with EFIS interface and AOA calibration procedure.

(Optional) Familiarization with Autopilot Servo Calibration procedure.

(Optional): Ensure Garmin ESP is disabled in the G3X EFIS setup menu.

Aircraft load-out: Total weight of aircraft plus pilot plus fuel plus ballast (if required) to equal 1050lb.

Ground observer: Station an observer at the side of the runway at approximately 500 ft from the threshold to mark the point on the runway where the aircraft left the ground.

FLIGHT PROCEDURE:

1/2 flap take-off (measure take-off distance)
Accelerate to 75 kt IAS, retract flaps.

Climb at 75 kt IAS until >1,000 ft AGL remaining within gliding distance of a suitable emergency landing location.

Section F2 - Flight Test Card - Flight #2 **Aircraft Registration:_____**

FLIGHT PROCEDURE (continued):

Set altimeter to 29.92 in Hg.

Full throttle climb performance check at 75 kt IAS. Begin filling in table when stabilized at 75 kt IAS. Airspeed must be held between 73 kt and 77 kt IAS for accurate results.

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

FULL THROTTLE CLIMB @ 75 kt IAS @ 1050 lb			
pressure altitude block	time at bottom of alt block	outside air temp at middle of alt block	time at top of altitude block
1,000 ft to 3,000 ft			
2,000 ft to 4,000 ft			
3,000 ft to 5,000 ft			
4,000 ft to 6,000 ft			
5,000 ft to 7,000 ft			
6,000 ft to 8,000 ft			
7,000 ft to 9,000 ft			
8,000 ft to 10,000 ft			

Balked landing/throttle response check:

With the airplane trimmed for steady flight at 55 kt IAS with power at idle, quickly advance the throttle (as would be the case in a "go-around" or balked landing) and re-trim for full throttle climb at 60 kt IAS. Perform this test a minimum of three times.

❑ Verify that engine powers-up smoothly each time upon rapid application of full throttle

(Optional) Autopilot Servo Calibration

❑ Calibrate Autopilot Servos per the Autopilot manufacturer's instructions.
❑ Autopilot check (LVL, Heading, Alt Hold, VS, AP Disconnect)
❑ Autopilot Control Head check (if installed) VS, Heading, LVL, altitude capture, GPS tracking.

Descend to 7500 ft density altitude, set throttle to 5000 RPM establish level flight. Allow airspeed to stabilize. Fly a 4-way speed box and fill in table.
(Optional: This may be accomplished using the autopilot.)

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

5000 RPM CRUISE PERFORMANCE @ 7500 ft DENSITY ALTITUDE					
GPS GRND TRCK	0 deg	90 deg	180 deg	270 deg	DENSITY ALT:
OBSERVED AIRSPEED (KT)					PRESSURE ALT:
GPS GRND SPEED (KT)					RPM:
FUEL FLOW (GAL/HR)					MAP:

Section F2 - Flight Test Card - Flight #2 **Aircraft Registration:_____**

FLIGHT PROCEDURE (continued):

Calibrate the Angle of Attack (AOA):

❑ Calibrate the AOA per the EFIS manufacturer's instructions.

Flight Envelope Expansion:

Extend flaps 1/2 allow speed to reach **82 kt IAS** (add power and/or descend as required). Perform easy maneuvers.

❑ Verify no unusual flying qualities or other unexpected behavior.

Fully extend flaps and allow speed to reach **82 kt IAS** (add power and/or descend as required). Perform easy maneuvers.

❑ Verify no unusual flying qualities or other unexpected behavior.

Descent:
Retract flaps. Set power and re-trim for approx 500 ft/min descent to traffic pattern altitude. During descent allow speed to reach **130 kt IAS**. Perform easy maneuvers.

❑ Verify no unusual flying qualities or other unexpected behavior.

Landing:

Power-off approach at minimum 55 kt with flaps as required for glide path control.

Section F2 - Flight Test Card - Flight #2 **Aircraft Registration:** _____

Post flight activities:

- ❑ Measured take-off distance. _____
- ❑ Calculate airfield density altitude for takeoff. _____
- ❑ Compare take-off distance to POH value. If take-off distance is greater than POH value, then adjust prop pitch flatter to increase RPM (adjust propeller pitch in 0.1° .increments).
- ❑ Download EFIS data, archive file. _____
- ❑ Enter data from four way speed box into RV-12iS Flight Test Data spreadsheet.
- ❑ Correct any engine issues (leaks, high temps, etc.). _____
- ❑ Correct any airframe system issues (non functional equipment, etc.) _____
- ❑ Fill fuel tank. Amount of fuel added: _____

Section F2 Flight Test completed by:

_____
Printed Name/Title

_____ _____
Signature Date

_____
Aircraft Serial Number

Type of authorization issued to conduct the flight testing.

_____
(Example: FAA 8130-7 Special Flight Permit)

Section F3 - Flight Test Card - Flight #3 **Aircraft Registration:_____**

DATE: ____-____-____	**BALLAST WEIGHT:** _____
PILOT: _____	**PILOT WEIGHT:** _____
TIME END: ___:___	**FUEL END:** _____ **(gauge)** _____ **(totalizer)**
TIME BEGIN: ___:___	**FUEL BEGIN:** _____ **(gauge)** _____ **(totalizer)**
OAT on ground END: _____	**BARO PRESSURE END:** _____
OAT on ground BEGIN: _____	**BARO PRESSURE BEGIN:** _____

LOCATION: _____

SURFACE WIND, END: _____@_____

SURFACE WIND, BEGIN: _____@_____

 # LANDINGS: _____

ACCELERATION LIMITS:	**4g (flaps retracted)**
	2g (flaps extended ½ or full)
AIRSPEED LIMITS:	**136 kt TAS with flaps up**
	82 kt IAS with flaps ½ or full

PRE-FLIGHT PREPARATION:

Set EFIS data log rate to 4 hertz. (Erase old flight data within EFIS, if downloaded)

(Optional): Ensure Garmin ESP is disabled in the G3X EFIS setup menu.

Aircraft load-out: Total weight of aircraft plus pilot plus fuel plus ballast (if required) to equal 1050lb.

FLIGHT PROCEDURE:

1/2 flap take-off
Retract flaps, accelerate to 75 kt IAS.

Climb at 75 kt IAS until >1,000 ft AGL remaining within gliding distance of suitable emergency landing location.

Section F3 - Flight Test Card - Flight #3 **Aircraft Registration:_____**

FLIGHT PROCEDURE (continued):

Set altimeter to 29.92 in Hg. Extend flaps to 1/2.
Full throttle climb performance check at 60 kt IAS. Begin filling in table when stabilized at 60 kt IAS. Airspeed must be held between 58 kt and 62 kt IAS for accurate results. Oil and/or Cylinder Head temperatures may climb into the caution range. The climb should be terminated if/as temperatures approach their limits.

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

FULL THROTTLE CLIMB @ 60 kt IAS @ 1/2 flap @ 1050 lb (476.27kg)			
pressure altitude block	time at bottom of alt block	outside air temp at middle of alt block	time at top of altitude block
1,000 ft to 3,000 ft			
2,000 ft to 4,000 ft			
3,000 ft to 5,000 ft			
4,000 ft to 6,000 ft			
5,000 ft to 7,000 ft			
6,000 ft to 8,000 ft			
7,000 ft to 9,000 ft			
8,000 ft to 10,000 ft			

Stalls:

Power Off w/recovery delayed 3 seconds after break (wings level & ball centered at entry; wings held level with rudder after break)

Flaps up (Vs)
❑ Verify no unusual flying qualities or other unexpected behavior.

Flaps ½ (Vs1)
❑ Verify no unusual flying qualities or other unexpected behavior.

Flaps full (Vs0)
❑ Verify no unusual flying qualities or other unexpected behavior.

If necessary, climb to no lower than 3,000 ft AGL and establish slow flight at 55 kt zero flaps, power as required to maintain altitude. Allow airspeed to stabilize. Fly a 4-way speed box and fill in table.
(Optional: This may be accomplished using the autopilot.)

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

55 kt & ZERO FLAP AIRSPEED CALIBRATION					
GPS GRND TRCK	0 deg	90 deg	180 deg	270 deg	DENSITY ALT:
OBSERVED AIRSPEED (KT)					PRESSURE ALT:
GPS GRND SPEED (KT)					RPM:
FUEL FLOW (GAL/HR)					MAP:

Section F3 - Flight Test Card - Flight #3 **Aircraft Registration:_____**

FLIGHT PROCEDURE (continued):

(iS ONLY) Eco Mode adjustment check:

At 7500ft density altitude, advance throttle to Eco Stop and maintain level flight. Allow airspeed stabilize.
NOTE: Do not exceed 5500RPM.
❑ Engine in Eco mode? Yes / No RPM:_____

Flight Envelope Expansion

Descent:
Set power and re-trim for approx 500 ft/min descent to traffic pattern altitude. During descent allow speed to reach **136 kt TAS.** Perform easy maneuvers.
❑ Verify no unusual flying qualities or other unexpected behavior.

Landing:
Power-off approach at minimum 55 kt with flaps as required for glide path control.

Post flight activities:

❑ (iS Only) Adjust Eco Stop (if required) _____
❑ Download EFIS data, archive file _____
❑ Calculate density altitude from climb performance data. Compare climb rate to POH value.
❑ Enter data from four way speed box into RV-12iS Flight Test Data spreadsheet
❑ Fill fuel tank. Amount of fuel added: _____

Section F3 Flight Test completed by:

_____
Printed Name/Title

_____ _____
Signature Date

_____
Aircraft Serial Number

Type of authorization issued to conduct the flight testing.

_____
(Example: FAA 8130-7 Special Flight Permit)

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Section F4 - Flight Test Card - Flight #4 **Aircraft Registration:_____**

DATE: ____-____-____	**BALLAST WEIGHT:** _____
PILOT: _____	**PILOT WEIGHT:** _____
TIME END: ___:___	**FUEL END:** _____ **(gauge)** _____ **(totalizer)**
TIME BEGIN: ___:___	**FUEL BEGIN:** _____ **(gauge)** _____ **(totalizer)**
OAT on ground END: _____	**BARO PRESSURE END:** _____
OAT on ground BEGIN: _____	**BARO PRESSURE BEGIN:** _____

LOCATION: _____

SURFACE WIND, END: _____@_____

SURFACE WIND, BEGIN: _____@_____

 # LANDINGS: _____

ACCELERATION LIMITS:	**4g (flaps retracted)**
	2g (flaps extended ½ or full)
AIRSPEED LIMITS:	**136 kt TAS with flaps up**
	82 kt IAS with flaps ½ or full

PRE-FLIGHT PREPARATION:

Set EFIS data log rate to 4 hertz. (Erase old flight data within EFIS, if downloaded)

Familiarity with EFIS interface and EFIS Pitch Offset adjustment procedures.

(Optional): Ensure Garmin ESP is disabled in the G3X EFIS setup menu.

Aircraft load-out: Total weight of aircraft plus pilot, fuel plus ballast (if required) to equal 1050lb.

FLIGHT PROCEDURE:

1/2 flap take-off
Retract flaps.

Climb at 75 kt IAS until >1,000 ft AGL remaining within gliding distance of suitable emergency landing location.

Section F4 - Flight Test Card - Flight #4 **Aircraft Registration:_____**

FLIGHT PROCEDURE (continued):

Set altimeter to 29.92 in Hg.

Climb or descend as required to achieve 7500 ft density altitude, set throttle to 5500 RPM and establish level flight. Allow airspeed to stabilize. Fly a 4-way speed box and fill in table.
(Optional: This may be accomplished using the autopilot.)

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

5500 RPM CRUISE PERFORMANCE @ 7500 ft DENSITY ALTITUDE					
GPS GRND TRCK	0 deg	90 deg	180 deg	270 deg	DENSITY ALT:
OBSERVED AIRSPEED (KT)					PRESSURE ALT:
GPS GRND SPEED (KT)					RPM:
FUEL FLOW (GAL/HR)					MAP:

EFIS Pitch Offset adjustment:

❑ If required, adjust the Pitch Attitude offset per the EFIS manufacturer's instructions.

If necessary, climb to no lower than 3,000 ft AGL and establish slow flight at 50 kt full flaps, power as required to maintain altitude. Allow time for everything to stabilize. Fly a 4 way speed box and fill in table.
(Optional: This may be accomplished using the autopilot.)

NOTE: Data recording for this task can be accomplished by extracting data from EFIS data log.

50 kt & FULL FLAP AIRSPEED CALIBRATION					
GPS GRND TRCK	0 deg	90 deg	180 deg	270 deg	DENSITY ALT:
OBSERVED AIRSPEED (KT)					PRESSURE ALT:
GPS GRND SPEED (KT)					RPM:
FUEL FLOW (GAL/HR)					MAP:

Descent:
Set power and re-trim for approx 500 ft/min descent to traffic pattern altitude.

Landing:
Power-off approach at minimum 55 kt with flaps as required for glide path control.

Section F4 - Flight Test Card - Flight #4 **Aircraft Registration:_____**

(Optional) IFR Checks:
- ❑ Verify VOR Functionality Position aircraft over known airborne checkpoint & verify VOR reading.
- ❑ Confirm NAV COM / GTN 650Xi is working properly for approaches.

Post flight activities:
- ❑ Download EFIS data and archive file.
- ❑ Enter data from four way speed boxes into RV-12iS Flight Test Data spreadsheet.
- ❑ Fill fuel tank. Amount of fuel added: _____

Section F4 Flight Test completed by:

_____
Printed Name/Title

_____ _____
Signature Date

_____
Aircraft Serial Number

Type of authorization issued to conduct the flight testing.

_____
(Example: FAA 8130-7 Special Flight Permit)

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Section G11 - Post Flight Test Check

❑ All Flight Test Cards F1-F4 completed and discrepancies resolved.

LANDING GEAR & BRAKES:

Remove main landing gear access covers on bottom of fuselage.

❑ Verify that main landing gear attach nuts are properly torqued.

FLIGHT CONTROLS:

❑ Verify Stabilator Cable Tension. See KAI 38iS/U-17.

For E-LSA aircraft, Van's does not require a copy of the completed PAP. We strongly encourage E-LSA builders to follow the procedures in this document and retain a copy with their aircraft records.

Section G11 Post Flight Test completed by:

_____
Printed Name/Title

_____ _____
Signature Date

_____
Aircraft Serial Number

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