

Aircraft Assembly Instructions
Supplement to Aircraft Operating Instructions
Apollo Delta Jet AS-III
Revision 0
May 12, 2006

Introduction

The following instructions describe assembly procedure for the Delta Jet AS-III out of the crate to first flight. Please contact Apollo North America Inc. or a dealer if there are any questions before proceeding if at all unclear. It is expected that a mechanic or dealer is doing this assembly and not an end user alone. Special knowledge or skill is required to do this assembly.

Definitions used in this document such as WARNING, CAUTION and NOTE are employed in the following context.

WARNING

Procedures or instructions that if not followed correctly may result in injury or death

CAUTION

Procedures or instructions that if not followed correctly may result in damage to the aircraft or its parts

NOTE

Procedures or instructions which are essential to highlight

What You Will Need

- 1) Metric Wrench Set
- 2) Metric Socket Set and Open Face Metric Wrench Set
- 3) Metric Allen Key Set and a Screw Driver Set
- 4) A Calibrated Torque Wrench in Inch-Pounds
- 5) Blue Loctite
- 6) High Temperature Silicone
- 7) Safety Wire and Safety Wire Pliers
- 8) A Hoisting Mechanism and Hoist Straps
- 9) A Hanger or Smooth Cement Surface
- 10) 14 US Gallons of 91+ Octane auto gas
- 11) 1 US Gallon Empty Water Bottle (Dry)
- 12) Two large soft Towels
- 13) A small step ladder
- 14) Cordless drill (optional) to take the screws off quickly to open the crate
- 15) Goo-Be-Gone (optional) and clean soft rags to wipe clean the tape marks from the trike fairing due to packing
- 16) Wax and wax cloth (optional) to polish the gel coat or paint finish to a luster
- 17) Marine corrosion prevention spray (waxy film – optional for areas near coast lines for spraying around bolt and nut fittings)
- 18) Aircraft Operating Instructions
- 19) Stratomaster Ultra Owner's Manual in printed form on hand

- 20) Mity-Vac brake bleeding tool unless your brakes are already bled
- 21) Grease in grease gun for putting in all bolt fittings that normally come out like mast folding bolt fitting, hang bolt fitting etc.

NOTE

Your trike has been protected against corrosion by using sprays such as CRC, WD-40 and Silicone spray inside the tubing and by spraying the steel parts and tubes inside and out. A regular regimen of cleaning with silicone spray and WD-40 every few months should help keep corrosion and rust away. Put grease on bolt passages that require heavy usage of assembly and dis-assembly like folding mast pivot bolt, hang bolt hole etc. Putting some grease on bolt ends after everything is secure will also make them last longer and protect from rust

How Long Should It Take

The whole assembly process is expected to take two people about 8 hours. However, this can vary depending on mechanical ability of the person's involved and possession of the right tools

Taking the Trike Out Of The Crate

- 1) Put crate on dollies or card board so it can be moved on the floor. Remove all four sides of the crate. Remove all bubble wrapped parts and reuse bubble wrap taped on square steel frame to protect the trike from scratching as it slides out



- 2) Remove windshield and temporary compression strut (small tube). Then remove 4 bolts at bottom of ground stand. Remove Jesus bolt and brackets and unscrew nose wheel strap to make the trike movable.

CAUTION

The ground stand underneath the engine mount swivels and also is slides out of the rear of the motor mount. Also the under mount radiator CAN touch the ground. If allowed to slip or swivel, it can cause damage to the trike carriage



- 3) Use a hoist or similar system and loop a "soft tie" around the prop shaft from outside the trike frame or behind the trike frame. A ratchet strap suspended from a rigid high mount will work as well. Make sure that the soft tie loop and hoist mechanism is BEHIND THE CRATE FRAME so that as the crate is slid forwards, the strap is NOT A HINDERANCE in this movement.
- 4) Once the slack is taken up in the hoist either the crate must be moved toward the nose of the trike (forwards) while the trike carriage stays under the stationary hoist or the trike carriage must be moved or

walked backwards out of the crate which requires multiple people. Three are ideal. Two to lift the engine ground stand from either side and one to steer the front wheel and guide the trike out of the crate. Once clear of the crate the trike should be lowered to the ground very carefully on the engine ground stand mechanism making sure it does not pivot fore or aft. If this mechanism is allowed to slip or pivot damage to the trike carriage can result. A chock placed in front of the front tire will come in handy at this time once the trike is stable on the ground.

CAUTION

The trike will be TOP HEAVY and will attempt to flip over once off of the ground stand. Someone will need to steer the nose wheel via the rear pedal controls to keep the trike centered in the crate. DO NOT TOUCH THE BRAKE PEDAL until the rotors/discs are inside the rear calipers. Two people should hold the sides of the motor to stabilize the trike, one person needs to steer the nose wheel and two people need to now slide the crate away from the aircraft while the trike hangs under the hoist.



Assembling The Trike Carriage

- 1) Carefully the large/real compression strut tube needs to be installed. Make sure that the carriage does not move or the ground stand under the

engine mount may swivel. Having multiple persons here to help is recommended.



- 2) Then the Jesus cable can be the new hang point to hoist or optionally you can keep the trike hoisted by the prop shaft with a soft tie. Once the trike is suspended from the mast CG or prop shaft securely, the ground stand may be pulled from under of the motor mount by hand.



- 3) Pull out 4 bolts and nuts for the rear leaf suspension and slide the leaf in after studying the simple bolt pattern.
- 4) Next remove rubber trim around drag link or main landing gear area.
- 5) Slide rear brake calipers through the landing gear cladding as it is slid up the suspension leaf.

NOTE

Do not disconnect the brake line. It will fit through after a few attempts of rotating the calipers



- 6) Next the aft side of the landing gear cladding/fairing must be inserted first then the front and finally the trim can be re applied. The big orange rubber washers go between the leaf and the cladding and between the cladding and the pod itself and are secured with bolts.

NOTE

Blue/Violet Medium strength Loctite needs to be used on the bolt that threads into the bottom of the leaf



- 7) Axle carriers are marked left and right and wheels are universal. The rotors will need to be loosened up enough to slide the large calipers over them and then set inside the wheel. Tighten the rotor and secure the caliper to the axle carrier using Loctite. The plastic spacer goes with the small side against the wheel bearing and is snugged with a large nut and then secured with a cotter pin. After that a washer is slid on to the smaller diameter of the axle then the wheel pant, then another washer, and then a lock nut.







- 8) Fill coolant (refer to engine manual), oil (refer to engine manual), brake fluid (DOT 4 ONLY – in some cases the brakes may already be bled for you; please check but **DO NOT depress the brake pedal** unless the brake calipers are around the rotors or discs or they can lock and will require complete re-bleed) and heavily preflight the engine and frame. Leave the rear cowling off until after the trike is broken in. Look for any loose bolts, nuts, hoses, clamps, leaks or anything out of the ordinary

NOTE

Hydraulic disc brakes can take DOT 4 brake fluid available at NAPA or motorcycle or ATV shops. 24+ ounces of fluid will be needed to bleed the brakes properly. Always use brake fluid out of a sealed container or impurities can be introduced that will destroy rubber seals and introduce water content, making the brakes fail. Use of a brake bleeding system like MityVac 07300 PneumaticVac (\$120 - \$130) makes the job much easier and as per recommendation of the service bulletin for bleeding brakes from the factory. Your mechanic or dealer should have a brake bleeding system



http://www.mityvac.com/pages/products_fee.asp

- 9) Hook up battery under the seat (wire with stripe is negative) and make sure all of the gauges are in proper measurements matching the values described on the placards containing temps. pressure, airspeeds etc.

NOTE

Make sure rev counter reads 60 per 60 under "calibration" for Rotax 912UL or 912ULS. See Stratomaster Ultra manual

- 10) Take the time to calibrate the gas tank at this point. Refer to Stratomaster Ultra Manual. Empty the gas tank of any existing fuel by using the quick fuel drain located on the underbelly of the trike. Use the one gallon empty water bottle to measure fuel quantity accurately for calibration. It's a good idea to shake the trike carriage back and forth while filling fuel for calibration to make sure any air bubbles trapped in the fuel tank can get out
- 11) This would also be a good time to set your Stratomaster Ultra options on the screen. Units can be selected, undesirable items on the main screen can be taken off and screen font can be set. Please refer to Stratomaster Ultra manual
- 12) Install prop set to 0 degrees and assume this will over rev the engine and proceed with caution before attempting full throttle. Prop bolts must be torqued to 175 inch-pounds. Refer to the prop manual. The **bolt torque and pitch of the blades** have to be re-checked **after 1,2,4,8 hours and then every 25 hours thereafter**
- 13) Turn the propeller blades by hand in the direction of rotation about 10 revolutions to prime with oil. Start the engine for 30 seconds and watch for immediate oil pressure and shut it down and check for leaks and all levels of fluids (after it cools)

Assembling The Wing

Please refer to the wing manual for assembly instructions

Attaching The Wing To The Trike Carriage

- 1) Place the assembled wing on its nose on a soft surface like grass with its nose cover/cone off
- 2) Undo the windshield on the trike carriage and store it in a safe place
- 3) Undo the pin for the compression strut on the front of the trike carriage fairing and gently and carefully drop the mast down. You may want to use the soft towel to protect the trike fairing
- 4) Guide the trike carriage over the control bar of the wing so that the trike carriage is centered and perpendicular to the wing
- 5) Lift the mast/pylon so that the hang block aligns with the mast. Slide the hangbolt, washers through and fasten the hangbolt and secure the pin. Jesus cable can be secured once the wing is up
- 6) Place a soft towel on the mast/pylon fairing. Use extreme caution and make sure that the keel of the wing is not able to make contact with the rear of the mast. This should be impossible due to the rubber stop at the top of the mast, but needs to be inspected before raising the wing.

- 7) Pulling straight up on the control bar with the wing keel locked against the mast rubber and plastic stop is recommended. Once the mast is fully extended the M8 mast bolt at the engine mount frame support needs to be slid through the mast/frame plate.
- 8) With the M8 bolt in place lower the control bar putting all of the weight on the mast and secure the bottom of the compression strut into the trike fairing bracket. Then place the wing nut on the mast bolt and add the safety pin.
- 9) Secure the Jesus strap around the wing keel. You may need a small step ladder

Misc. Steps

- 1) If a ballistic parachute is installed, secure its straps around the wing keel as recommended by the ballistic parachute manual at this point.
- 2) Place a liberal amount of high temp silicone spread lengthwise on the exhaust springs. Let dry.
- 3) Trike is ready for pre-flight. A very thorough pre-flight should be conducted. Refer to aircraft operating instructions for a pre-flight checklist
- 4) The trike may be flown with either both rear engine cowlings off or both on. It is suggested to fly with both off for the first hour and recheck everything before installing the rear covers. Don't forget to pull the shoulder harnesses through before securing the top cover.

Production Acceptance After Final Assembly

The dealer or factory representative should perform the first pre-flight which should be as thorough as possible and then using the Production Acceptance Criteria sheet do a minimum flight of 15 minutes in calm conditions in a safe flight area, to notice any abnormalities and note them in writing.

Wing may need to be tuned for turns, propeller blades and pitch may need changing (reach at least 5600 RPM on climb out but no more than 5800 RPM). Stall speed should be checked by climbing up to 1500+ feet AGL. Any tendency of wing dropping to one side should be noted from level power off stall (no power-on stalls due to avoiding whip stalls). Pitch stability of the wing should be normal. Only after this flight and correction of problems encountered should the trike be considered ready for end user's flight. On first flight please keep a keen eye on the engine instrumentation. Please refer to sample Production Acceptance Criteria sample document for an example of this testing.

Please remember the prop pitch and bolt torque should be re-checked after 10 minutes of running the engine, then at 1, 2, 4 and 8 hours and then every 25 hours after that. If the trike is equipped with a 582 Rotax engine, the break-in procedure recommended by Rotax should be followed before first flight

HAVE FUN!
Apollo North America Team