

Unlock the Beauty and Performance of Your Jet



ATLAS® Active Winglets for Cessna Citation CJ, CJ1 & CJ1+

TRIM ITEM# 41 AS REQD
AROUND ITEM# 11
CUT TO MATCH LIGHT B



INBD

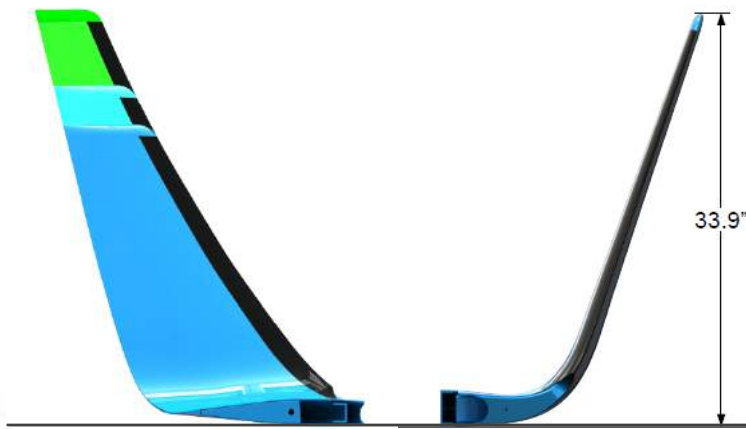
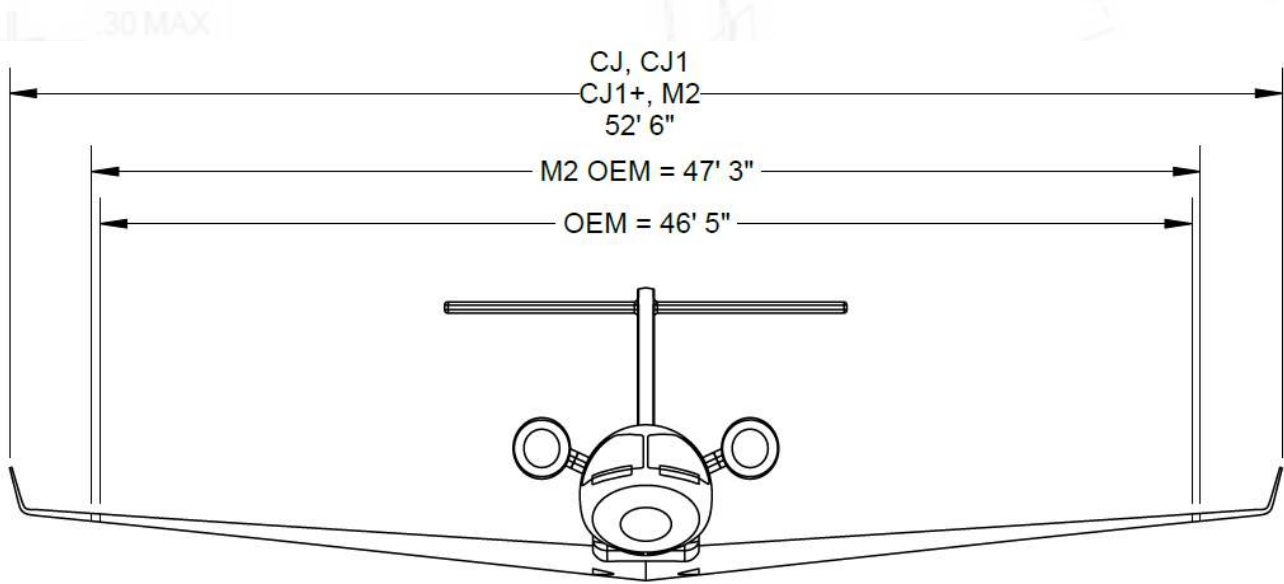
UP



ATLAS Active Winglets for Cessna Citation CJ, CJ1 & CJ1+

- Increased range
- Reduced time to climb to FL410
- Fuel savings & reduced CO2 emissions
- WAT (Hot/High) Table Increase of 500lbs
- 400lbs higher MZFW
- Higher useful load due to fuel savings
- Ride smoothing & stability
- Greatly improved single engine climb performance
- Structural envelope protection
- Greater glide distance
- Upgraded LED navigation & anti-collision lighting
- Ramp appeal & aircraft value retention

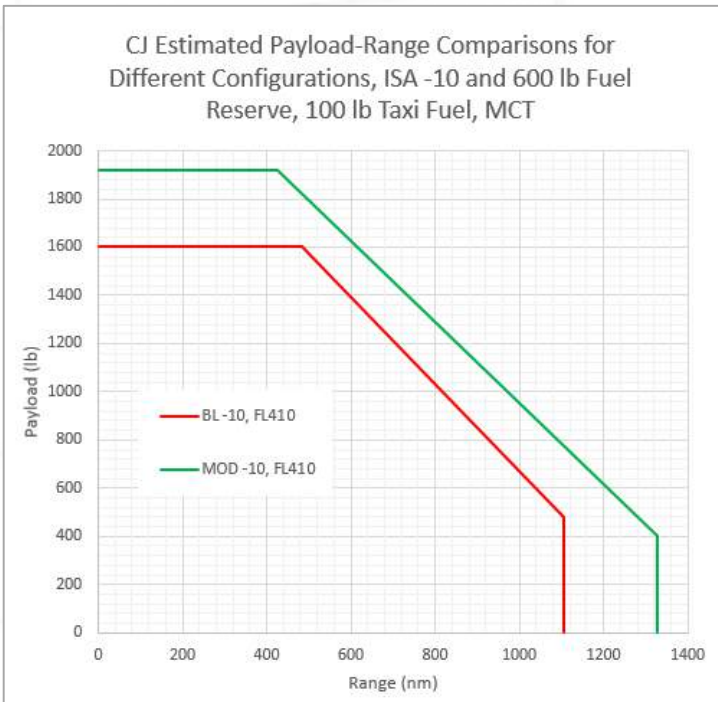
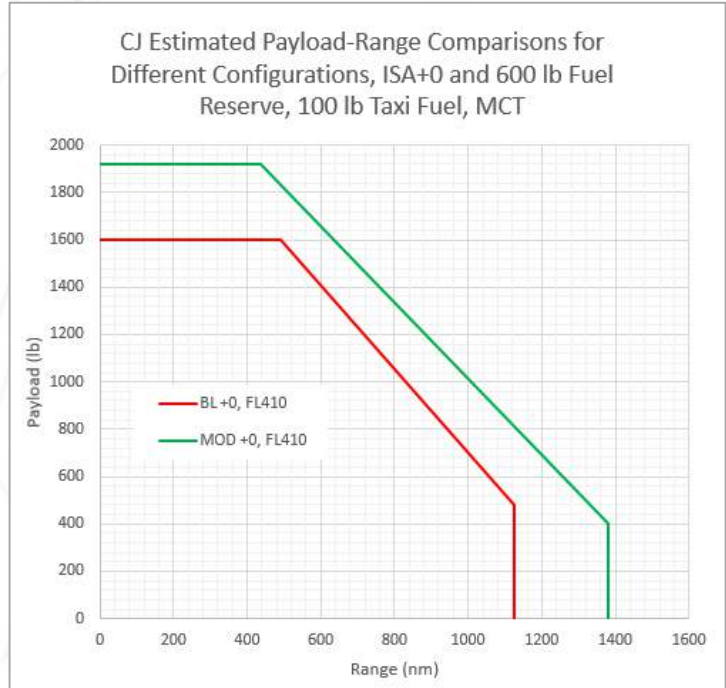
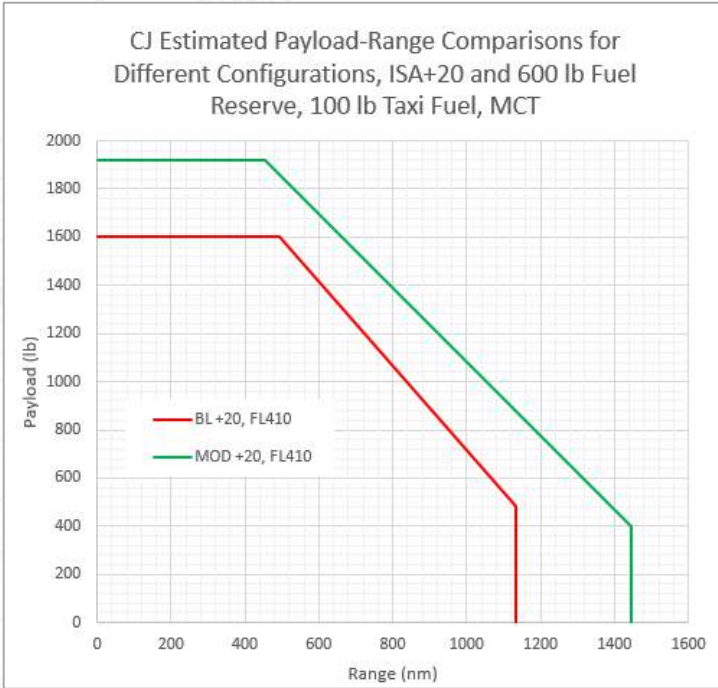
ATLAS Active Winglet Specifications



Total System Net Weight Increase	79 lb.
Max Zero Fuel Weight Increase	400 lb.

Payload-Range Comparisons - CJ

31



41

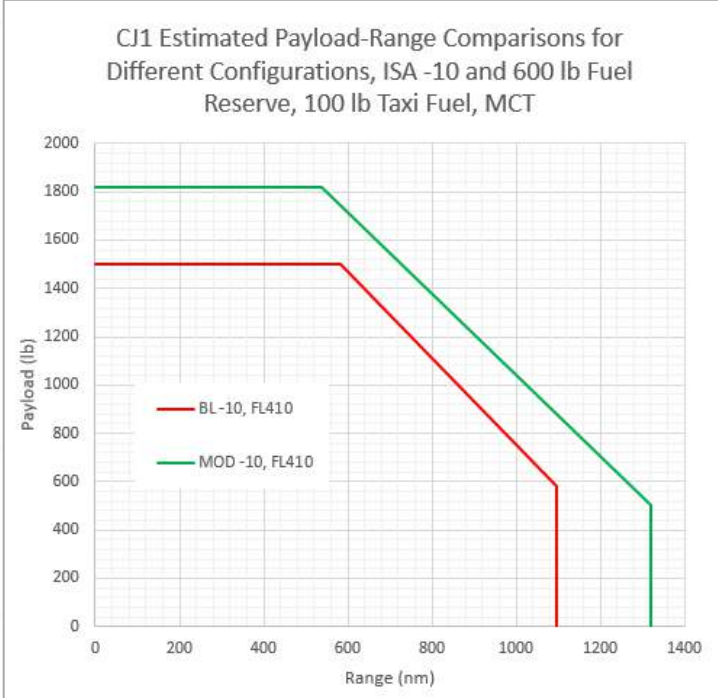
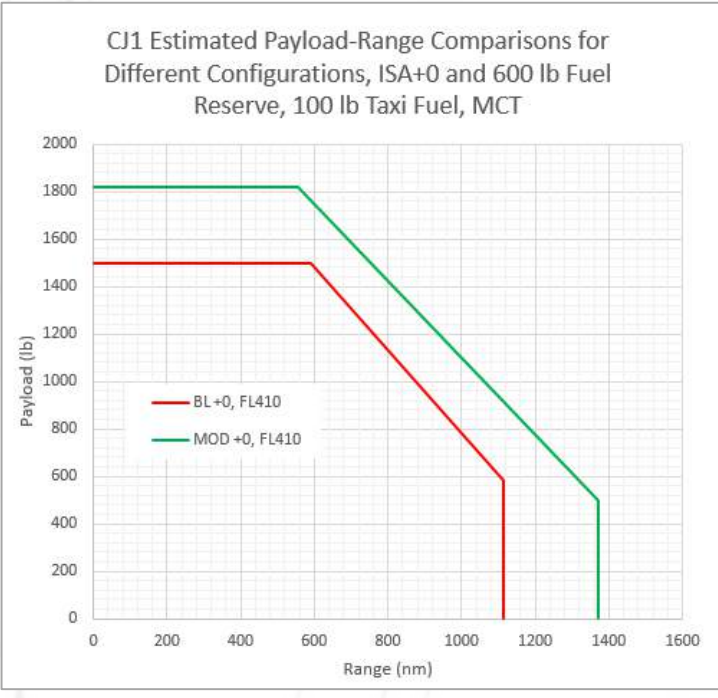
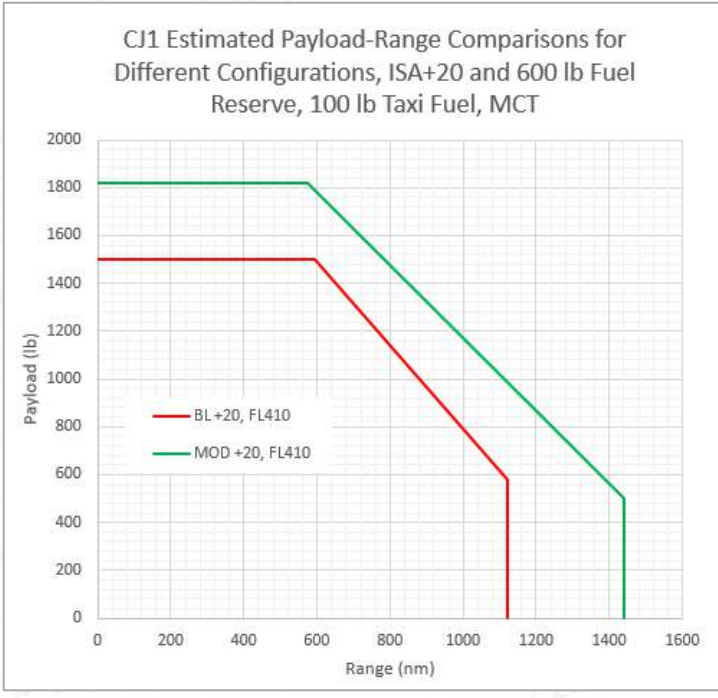
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Note: Specifications are based on analysis and real-world test flight data. Performance may vary by individual aircraft.

Payload-Range Comparisons - CJ1

31



41

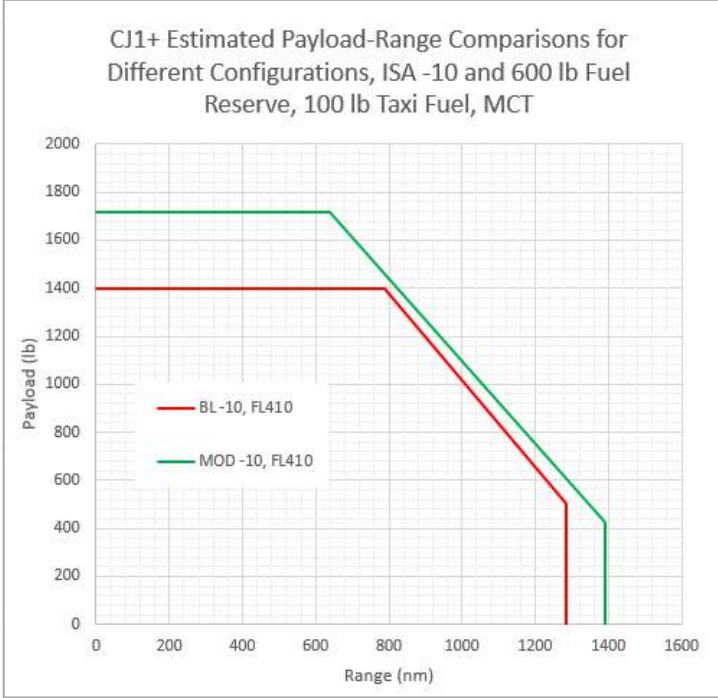
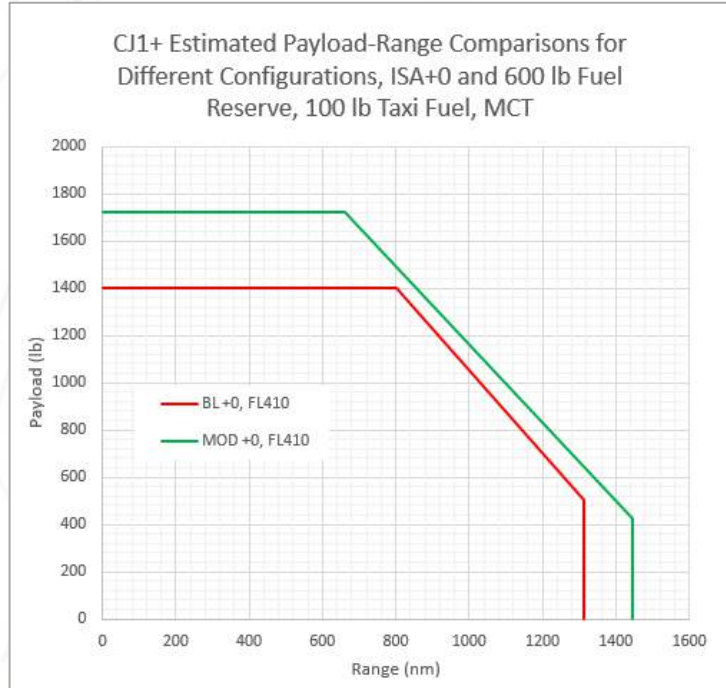
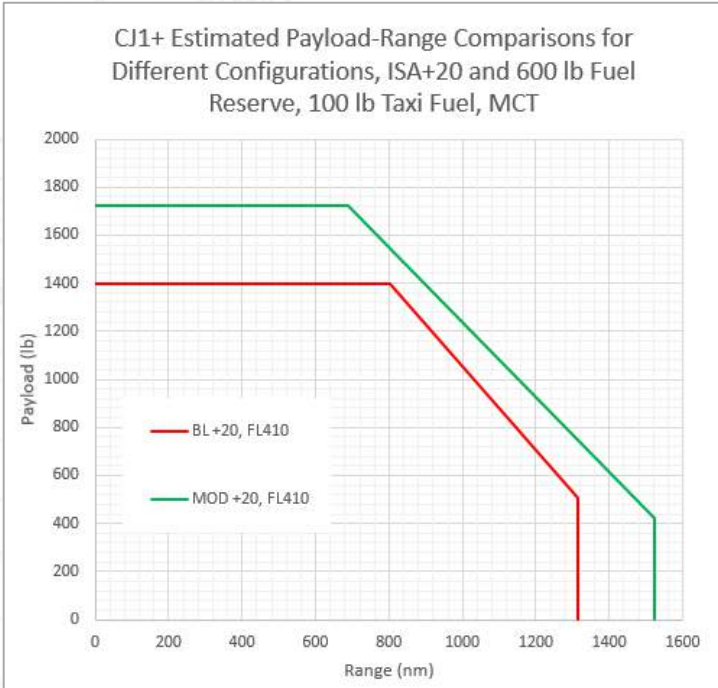
TRIM ITEM# 41 AS REQD
AROUND ITEM# 11
CUT TO MATCH LIGHT B

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Payload-Range Comparisons - CJ1+

31



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TRIM ITEM# 41 AS REQD
AROUND ITEM# 11
CUT TO MATCH LIGHT B

Note: Specifications are based on analysis and real-world test flight data. Performance may vary by individual aircraft.

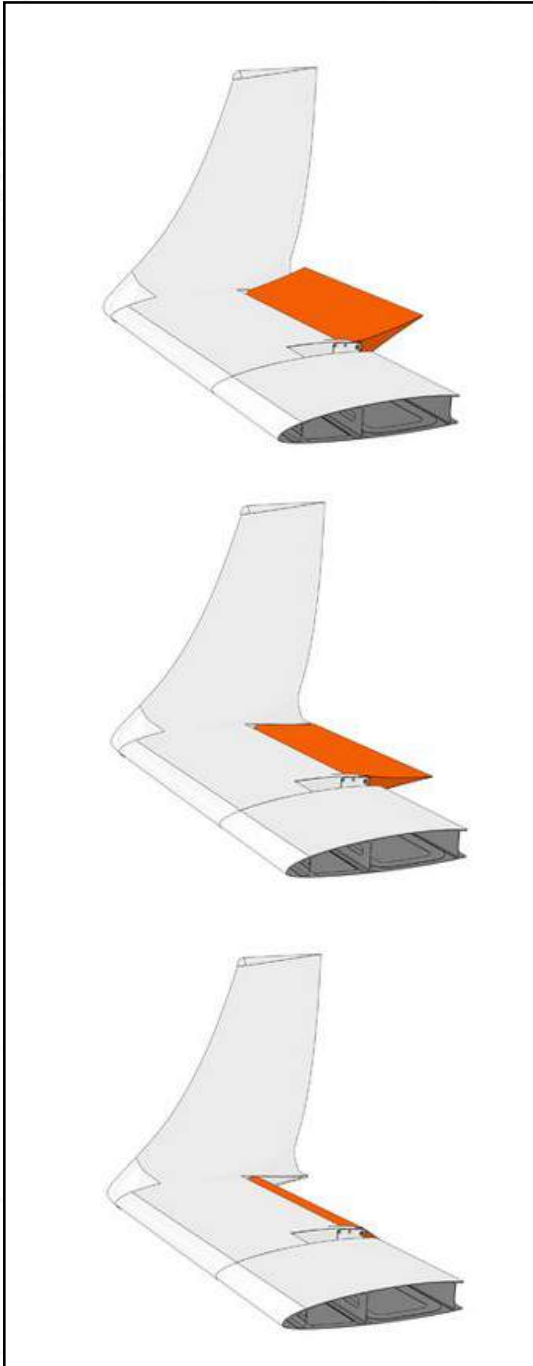


The Passive Winglet Problem

Winglets have been around for 100 years and work by increasing the wing's aspect ratio, which increases aerodynamic efficiency (think gliders).

All winglets to date have been passive winglets, and cannot adapt to changing wing loads.

Passive winglets increase wing bending, especially during large gust events or high-G maneuvering, and as a result, require additional wing structure to protect the wing, but this adds weight.



The Active Winglet Solution

But what if a winglet could intelligently 'turn itself off' during load events and be optimized for peak efficiency the rest of the time?

ATLAS does exactly that.

Using load sensors, and a camber surface that can respond in fractions of a second, the Active Winglet can automatically control wing loading during load events.

ATLAS is fully automatic, requires no pilot action, and functions autonomously from other aircraft systems.

The result is peak efficiency without the need to add additional wing structure – and an Active Winglet that allows 'bolt on' installation.

How ATLAS Works

ATLAS Active Winglets consist of three main parts:

- The wing extension
- The TACS (the load alleviation element)
- The winglet itself

The patented combination of all three parts makes Active Winglets two to three times more efficient than passive winglets.

Within the aircraft itself are five control and indication elements:

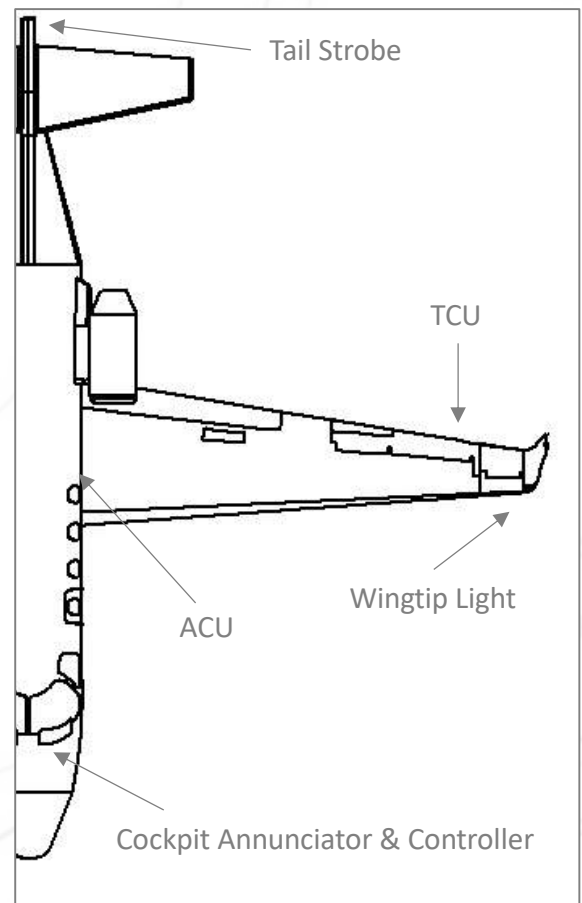
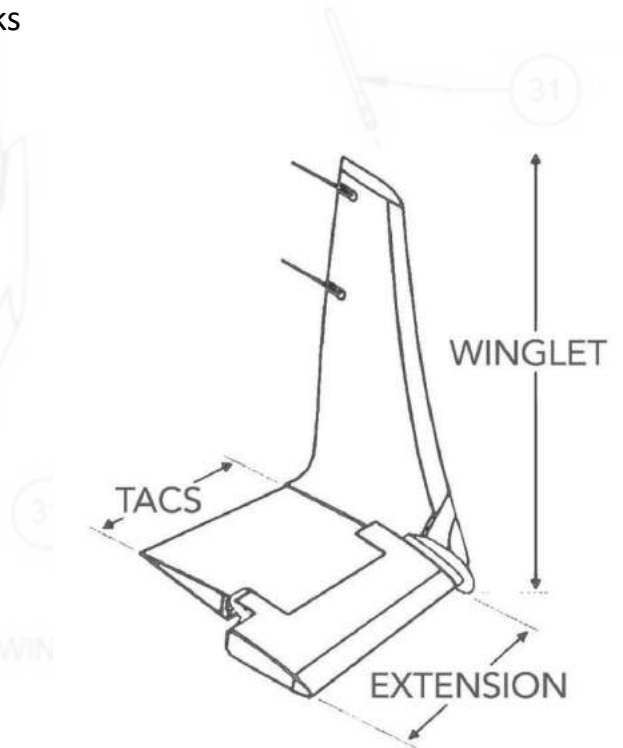
- The ATLAS Control Unit (ACU) which senses loads
- The two wing mounted TACS Control Units (TCUs) which are high speed actuators
- The ATLAS cockpit annunciator
- The ATLAS cockpit annunciator controller

As the ATLAS Control Unit (ACU) in the aircraft senses increased loading, it commands the TACS Control Unit (TCU) to position the TACS to aerodynamically 'turn off' the Active Winglet.

System operation is completely automatic. Failure modes are benign and the only required pilot action in the event of a failure is to slow to the indicated airspeed shown on the cockpit annunciator.

ATLAS has been extensively flight tested with ice shapes (normal and asymmetrical), TACS positioned in all modes, and even with only one Active Winglet on the aircraft. At all times the aircraft control surfaces have authority for normal handling.

Updated LED wingtip and tail strobes are included as part of the ATLAS installation kit.





CJ3. Paris, TX to Paris, France. *One Stop.*

Carrying two pilots, one passenger and loaded to max takeoff weight, the jet departed Paris, Texas flying 2,104 nautical miles to St. John's, Newfoundland (CYYT).

The flight had a 4 knot tailwind and flew at 376 knots true airspeed for 5 hours and 32 minutes.

The total fuel burn for the first leg equaled 3960 pounds (107 gallons per hour block fuel burn).

The St. John's, to Paris Le Bourget flight, a distance of 2244 nautical miles, took 5 hours and 45 minutes flying at 373 knots true airspeed with a 17 knot tailwind.

The total fuel burn for the transatlantic leg was 4210lb (108 gallons per hour block fuel burn).

Fuel burn at maximum Mach number at Flight Level 450 has typically dropped from around 800lb/hr. to 700lb/hr.

Combined with a faster time to climb and much quicker acceleration when leveling at cruise altitude, the fuel savings significantly extend the range of the CJ3.

Testimonials



"As a professional pilot, I must say that TAG's winglet- equipped CJ was impressive from takeoff at MTOW, to touchdown. The noticeably improved climb performance experienced through the flight levels is a testament to the success and effectiveness of Tamarack's winglet technology. Fuel consumption to top of climb (TOC) at FL410 was only 560 lb. (82 gallons) and just under 35 minutes, which is a big advantage over the winglet-less platform.

Climb rate in the mid-flight levels, especially in turning flight, was definitely improved. Acceleration at level off (FL410) to cruise speeds and a favorable angle of attack occurred much quicker than normally experienced. Tamarack's new technology has the potential to transform how we think about retrofit winglets on light jet aircraft and evaluate many additional benefits that active winglets provide, including improved aircraft performance, operating efficiency, and ultimately cost savings."

---Jason Herman - Professional Pilot, CJ3/CJ4, ATP, CFI/CFII/MEI, ADX



"A recent flight from Carlsbad to Sandpoint was the first time I flew the ATLAS™ - equipped CJ on any kind of a normal or typical point-to-point flight. The airplane flies superbly with the ATLAS™. I frequently encounter airplanes and products that don't quite live up to their manufacturer's claims, but the ATLAS™ is everything that Tamarack claims, and more. Unlike the factory CJ, the ATLAS™ CJ smoothly and swiftly climbs to FL410.

The stock airplane struggles above 370 at a weight with fuel for a maximum-range trip. The fuel burn claim of "900/600/600/600" is dead on, as we demonstrated on the CRQ-SZT flight. The standard airplane could not have made that flight, and would have had to make an enroute fuel stop. It is worth noting that the flight experienced a 100+ knot direct headwind for the entire flight, and still reached Sandpoint with acceptable reserves for the weather conditions. And subjectively, there is a smoothness to the feel of the airplane (it's hard to describe) that may be due to a change in wing loading with the winglets. In any case, it is a more pleasant feel, from a pilot's point of view. I very much hope that I am able to fly the ATLAS™ CJ again, and look forward to the day when all CJs will be ATLAS™ -equipped. Once the word gets out, that shouldn't take long."

--- Randall Brink, ATP, CE-500, CE-510, CE525S, DC-3, SA-227, DHC-8, LR-60

Testimonials



"I want to thank the Tamarack Aerospace Group for the opportunity to fly its CJ, equipped with your Active Winglet technology. Without question they exceeded my expectations - which were already high based on your reported data. Climbing to FL 400 in 20 min. and maintaining 1000 ft. per minute climb though the last 1000 ft. of climb was most impressive. In my CJ1, I fly in the FL 390 – 410 range quite often and normally take 40 - 45 minutes to get there, usually requiring an intermediate stop for a couple of minutes along the way.

Another observation; after reaching FL 400, the aircraft accelerated to cruise much quicker than I experience in my plane. In addition, when I disconnected the autopilot, I was very impressed with the responsiveness of the controls and the stability of the plane. In my opinion the plane is also a much improved instrument platform when hand flying in the landing configuration. Please do not hesitate to use me as a reference to anyone considering your winglets. I am certainly looking forward to getting my plane retrofitted as soon as possible."

--- John Hammill, S/N 525-0418, N300BV. Owner, Hammill Mfg. Co.



"Climbing out of the first 10,000 feet things pretty much felt the same, however as we got higher I noticed the VSI was indicating significantly more climb than I am used to seeing. After a bit of back and forth between approach and center we were cleared up to FL410. The airplane made it up there in under 30 minutes (inclusive of a brief hold at 12,000 for ATC), and to my surprise used under 500 pounds of fuel to do so (I had a flight the next day in my 525 and noticed I used about 800 pounds to climb to FL390 - wow, quite a difference).

Once there, the airplane accelerated quickly to cruise speed, shedding any induced drag built up in the climb as evidenced by the AOA retreating. I also took it off Auto Pilot (and Yaw Damper) at FL 410 and made some turns. The feel was solid and there was no hint of buffeting, yawing, or squirrelness on the controls. Overall I was impressed by the effectiveness of the technology. The benign nature of the installation requires no structural modifications and the fail-safe mode simply allows the active surfaces to trail on failure."

- Harry Hedaya, ATP, N525HA, S/N: 525-0081

Installation Centers

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