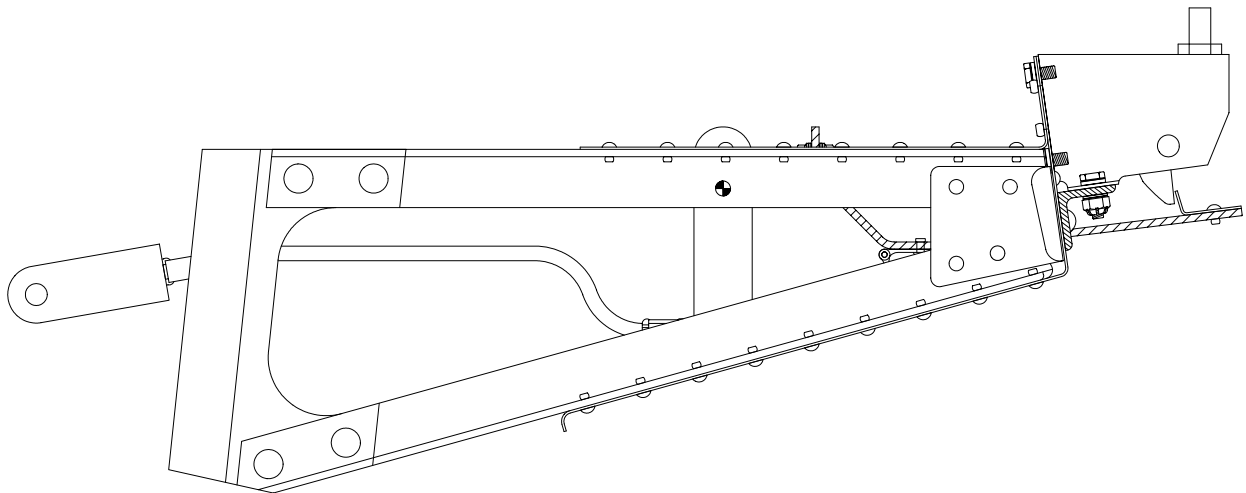


**Aero Twin, Inc. Rudder Gust Lock,  
P/N AT-RL-1001  
for  
Cessna Model 208, 208A, and 208B**

**INSTALLATION INSTRUCTIONS**

Document No. AT-RL-1001-IM



<b>LOG OF REVISIONS</b>			
<b>REVISIONS</b>		<b>PAGES REVISED AND</b>	<b>AERO TWIN</b>
<b>NO.</b>	<b>DATE</b>	<b>DESCRIPTION OF REVISIONS</b>	<b>APPROVAL</b>
			<b>SIGNATURE</b>
--	12/13/96	Original Issue, Issued Per ECO AT-31	
A	06/15/99	All pages revised per ECO AT-53	
B	01/19/01	Pages 2, &, 5 revised per ECO AT-63	

## Aero Twin, Inc. Rudder Gust Lock P/N AT-RL-1001

### 1.0 Installation

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1. Remove the C208 Caravan tail cone per the Cessna maintenance manual. Please use the 208 series maintenance manual D2075-13, dated September 2, 1986, or newer applicable revision.
2. Position the pre-drilled and bent cross-member doubler, P/N AT-RL-1024, in the tail cone per installation drawing AT3001-I, sheet 1. Cut and/or grind the cross-member, PN 2612047-10, to match the doubler. Drill cross-member and tail-cone skin using existing holes in doubler as pilot holes. Rivet together as specified on sheet 1. Material might need to be removed at the ends of the doubler to fit tapering members inside of the tail cone.
3. Remove the rivets at the base of the rudder which are to be used to attach the rudder strike plate. Locate these eight rivets, (four on each side), by positioning the rudder strike plate as illustrated on Drawing AT3001-I, sheet 2. Remove the rivets with a #30 bit and ensure ¼ inch clearance on either end between the edge of the sheet and rivet centerline.
4. Attach the rudder strike plate, P/N AT-RL-1027 or AT-RL-1030, to the rudder per Drawing AT3001-I, sheet 2. Four shims must be inserted between the strike plate flanges and the rudder bottom rib flanges as illustrated in the drawing, detail 1. Drill shims using rudder holes as guides, maintain minimum edge distance of 0.25. Check and rebalance the rudder per the Cessna maintenance manual.
5. Remove ten rivets (five on each side) on the rear bulkhead angles as illustrated on Drawing AT3001-I, Sheet 3. Drill heads with a #21 bit and punch out stem. Drill existing holes with #10 bit. Countersink the two upper-most holes, ensuring countersink is located on the inside of the rear bulkhead angles. Install 2 MS24694-53 countersunk screws in the upper two holes, per drawing AT3001-I, sheet 3. Secure with washer and lock-nut.
6. Engage the elevator control lock at the control yoke. Remove the AN4-13 bolt holding the elevator control horn to the elevator push rod. The elevator control horn is about 2 inches inside the upper rear bulkhead center circular access hole.
7. Fit the mounting bracket to the rear fuselage bulkhead angle per Drawing AT3001-I, sheet 3. With the bracket in the proper position, drill the required mounting holes in the bracket attach plates with a #10 bit, using the eight rivet holes in the rear bulkhead angles as guides.
8. Check the position of the linkage by performing the following steps.
  - (i) Attach the mounting bracket to the rear bulkhead angles with sheet clamps (clecos).
  - (ii) Attach the connecting tube to the elevator control horn, per drawing AT3001-I, sheet 4.
  - (iii) Check control linkage travel and ensure it does not rub or bind. Ensure rudder lock installation has 3/16 inch clearance between the rudder torque tube and the control linkage.
  - (iv) Engage the elevator control lock in the cabin on the control yoke. Engage the rudder lock, using the control handle to position the pin up.
    - (i) Ensure release rod stop is 0.050 to 0.100 inch aft of the rudder lock cam follower (see Figure 1). This clearance determines the elevator angle at which the rudder lock releases. A clearance of 0.050 to 0.080 will cause the rudder lock to release at

approximately 1 degree up elevator. Any required adjustment should be made as follows:

- a) Disconnect the rod end located at the aft end of the connection tube from the lower end of the bell crank by removing the nut and bolt (AN3-7). Loosen the AN315-3R check nut that secures the rod end and turn the rod end in or out as required to provide proper clearance. At least four threads of the rod end must be engaged in the connection tube. When clearance is set, torque the check nut to 20 to 25 inch pounds, and reconnect the rod end to the bell crank; use a new cotter pin to secure the nut.
  - b) If the available adjustment at the rod end is insufficient, adjustment can be made at the pin eye at the forward end of the release rod. The two nuts which secure the pin eye to the bar can be run up or down the pin eye threads to produce the required clearance at the release rod stop. After adjustment torque the nuts to 10 to 15 inch pounds. Note that adjustments made here can affect the motion of the release rod so as to change the vertical clearance between the release rod stop and the lock body (see next step).
- (v): Check that there is at least a ¼ inch of clearance between the top of the release rod stop and the bottom of the rudder lock body. If not, carefully bend the release rod (1"x1/8" aluminum bar) as required to provide adequate clearance
- (vi): Remove the elevator control lock and pull back on the yoke; the rudder lock should release when the elevator is between neutral and 4 degrees up. Make additional adjustments if required.

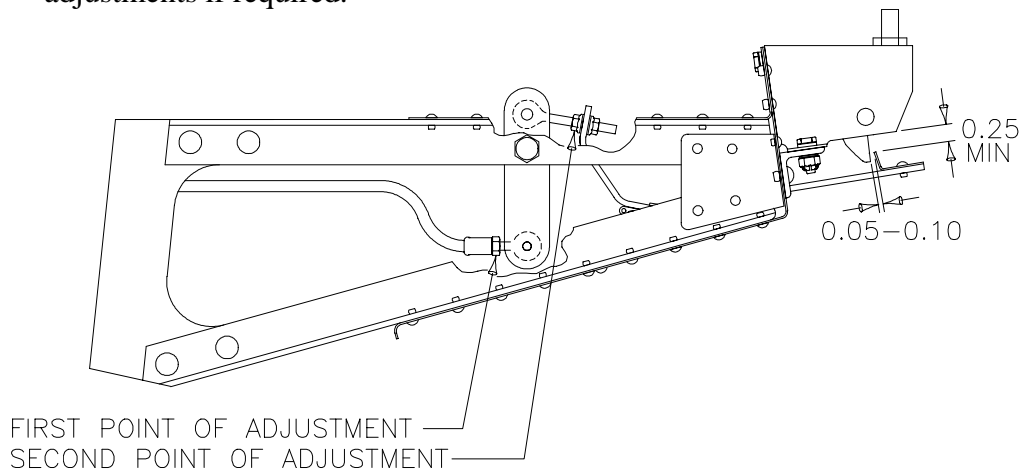


Figure 1: Measurements and Adjustments

9. When the linkage operates as required by the preceding step, the rudder lock bracket can be permanently installed with bolts, per Drawing AT3001-I, Sheet 3. Re-check to ensure that the connecting tube is properly attached to the elevator control horn and to the tie rod end at the bottom of the bell crank assembly.
10. To facilitate installation and removal of the tail cone, a relatively large (1.5" x 4.5") slotted hole will be cut in the tail cone where the rudder lock control shaft protrudes. (See drawing AT3001-I, sheet 5) The approximate point on the tail cone where the shaft penetrates is found by using a triangulation method. With the tail cone still removed, measure, using trammel points, from the centerline of the bottom tail cone mounting hole to the centerline of

the rudder lock manual release shaft at the point along its length where it will penetrate the tail cone. Using the corresponding hole on the tail cone, scribe or mark an arc on the tail cone at the approximate hole position. Repeat the procedure, this time using the centerline of the top tail cone mounting hole to the shaft. At the intersection of the scribed or marked arcs, drill a 1” diameter hole through the tail cone.

11. Locate the centerline of the rudder lock locking pin by using trammel points as illustrated on sheet 5 of the installation drawings. Measure distance between centerline of the surface tail cone mounting hole (right side) to centerline of rudder lock locking pin. Repeat the measurement for the left side. Scribe arcs on the tail cone using corresponding holes and measurements measured on the aircraft. Drill a .65” diameter hole at the intersection of the arcs. If the lock binds when it is engaged, this hole can be enlarged to 1” if necessary.
12. Remove the rudder lock handle from the shaft. Install the tail cone with the rudder lock disengaged. Tighten several screws to secure tail cone. Install the grommet in the .75” hole in the cover plate, PN AT-RL-1019 as shown on sheet 6. Slide the cover plate over the shaft and position it horizontally against the skin of the tail cone. Drill six holes in the tail cone with #10 bit using the holes in the cover plate as a pilot. Trace outline of cover plate onto skin using pencil. Remove the tail cone and use the doubler (PN AT-RL-1119) as a template to mark the outline of the slotted hole, (align the doubler in the pencil outline). Also mark 12 rivet holes, using pattern similar to that on sheet 6, maintaining 0.25” minimum edge distance. Cut out slot and drill 12 holes. Clean and de-burr all edges and install the doubler on the inside surface using the 12 rivets provided.
13. Re-install the tail cone and tighten the stabilizer fairing, per the Cessna maintenance manual. Install the cover plate using the AN525-832R5 screws supplied in the kit. Affix the placard to the cover plate as shown on sheet 6.
14. Install the control handle on the handle shaft of the rudder lock. Check the condition of the Rudder Lock Placard (Cessna PN 2605023-3 or Aero Twin, Inc. PN AT-RL-1031) at the nose gear fairing. Replace if worn or missing. If you need one, contact Aero Twin at (907) 274-6166.
15. Check operation by first securing the elevator with the control yoke lock, then engaging the rudder lock. With the rudder lock engaged, the rudder should only move about ½ inch at its farthest aft point. Remove the elevator control yoke lock and pull back on the yoke. The rudder lock should disengage. With the lock free, the rudder should move freely with at least 1/8 inch minimum clearance between the top of the rudder lock body and the bottom of the strike plate on the rudder.

## 2.0 Weight and Balance

1. Execute the FAA Form 337 in duplicate, stating that this rudder lock kit was installed in accordance with this STC. The change in airplane empty weight and balance is as follows:

	<u>Wt.(lb.)</u>	<u>F.S. (in)</u>	<u>Mom/1000</u>
Model 208 &208A:	4.0	437.6	1.75
Model 208B:	4.0	485.6	1.94

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