Aero Twin, Inc. Rudder Gust Lock Kit No. QK-4111
for
Quest Kodiak 100 Aircraft

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Document No. QK-4111-ICA

Maintenance Manual
FAA Approved Airworthiness Limitations
Illustrated Parts List

Aero Twin Approved: _____
President
Aero Twin, Inc.
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LOG OF REVISIONS

REVISIONS NO.	REVISIONS DATE	PAGES REVISED AND DESCRIPTION OF REVISIONS	APPROVAL SIGNATURE
--	03/17/14	Original Issue	--

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1.0 Maintenance Manual

Numbers in parenthesis refer to item numbers in section 3.0.

1.1 Removal of tail stinger/fairing assembly:

(i): Disengage the rudder lock.

(ii): Remove the rudder lock handle cover plate (33) on the bottom of the tail fairing.

(iii):Remove the stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual.

1.2 Removal of rudder lock assembly:

(i): Remove the tail stinger/fairing assembly in accordance with paragraph 1.1 of this document.

(ii): Remove the bolt (13), washers (11), nut (14) and cotter pin (15) which secure the release linkage pushrod assembly (38) to the rudder lock (1) activation arm.

(iii):Remove the handle assembly (39) from the release linkage bellcrank assembly (40) and slide the handle down out of the handle cover plate (33).

(iv):Remove the bolt and associated hardware, (20) thru (26), that secure the release linkage bellcrank (19) to the angle (27).

(v): Remove the three bolts and washers, (8), (9), and (11), on the front of the lock assembly (1), the bolts (9), nuts (12), and washers (10) and (11) on either side of the lock assembly, and the screws (31) and (45), washers (47), and nuts (48) that secure the assembly (1) and braces (43) and (44) to the bracketry.

(vi):Optionally, the braces (43) and (44) may be removed from (1) by removing bolt (46) washers (11) and nut (48).

1.3 Configuring aircraft for operation with rudder lock assembly removed:

(i): Remove the rudder lock assembly in accordance with paragraph 1.2 of this document.

(ii): Reinstall the tail stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual. Install the rudder lock handle cover plate (33).

(iii):Make log book entry stating that rudder lock assembly has been removed for service. Update aircraft weight and balance data using data given in paragraph 1.8 of this document.

1.4 Reinstallation of rudder lock assembly:

(i): If the aircraft was operated with the rudder gust lock assembly removed, prepare for reinstallation as follows:

a) Remove the stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual and remove the rudder lock handle cover plate (33) from the stinger/fairing.

b) Reinstall lock mechanism (1) and braces (43) and (44) on bracketry (2) and (3) using the three bolts and washers (8), (9), and (11) on the front of (1), the two bolt (9), nuts (12), and washers (10) and (11) on the sides of the lock and screws (31) and (45), washers (47) and nuts (48) on the front of (43) and (44).
c) Reinstall the linkage bellcrank (19) on the angle (27) using hardware (20) thru (26). Bellcrank should rotate freely.
d) Reconnect the release linkage pushrod assembly (38) to the lock mechanism (1) release arm.
e) Slide the handle (39) through the handle cover plate (33) and reattach to the release linkage bellcrank (19).

(ii): Adjust length of the release linkage pushrod (38) and handle (39), if necessary, by turning the fork fittings (16) in or out on their threads to assure that the lock fully engages and disengages without binding the linkage and that the handle (28) penetrate the cover plate (33) by approximately one-half inch when in the unlocked (handle up) position. See paragraph 1.5 for more details.

(iii):Ensure jamb nuts (17) on release linkage pushrod (38) and handle (39) are tight against the fork fittings (16) and the fork fitting on the handle (39) is safetied to the safety wire tab on the handle to prevent it from rotating loose.

(iv):Reinstall the tail stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual. Install the rudder lock handle cover plate (33).

1.5 Detailed Functional Checks and Adjustments:

(i): Remove the tail stinger/fairing assembly in accordance with paragraph 1.1 of this document.

(ii): Check control linkage travel and ensure it does not rub or bind.

(iii):Engage the elevator control lock in the cabin on the control yoke. Engage the rudder lock (1), pulling down on the control handle (39) to raise the pin to the 'locked' position. The control linkage bellcrank (19) should be positioned so the left side of the bellcrank is up and the bellcrank is tilted at approximately a 30° angle from horizontal. Adjust the length of the release linkage pushrod assembly (38) by screwing the fork fittings (16) in and out as necessary to achieve this bellcrank rotation angle. Tighten the jamb nuts (17) against the fork fittings once the proper length is achieved.

(v): Remove the elevator control lock and pull back on the yoke; the rudder lock (1) should release when the elevator is between the elevator control lock position and 6 degrees up.

(vi):With the rudder lock (1) disengaged, the control linkage bellcrank (19) should be positioned so the right side of the bellcrank is up and the bellcrank is tilted at approximately a 45° angle from horizontal.

(vii):With the rudder lock (1) disengaged, the handle (29) should protrude below the bottom of the tail stinger/fairing by approximately 2 inches, to allow the operator to easily pull on the handle. If needed, the length of the handle can be adjusted by adjusting the position of the fork fitting (16). Once the proper length is achieved, tighten the jamb nut (17) against the fork fitting and safety the fitting from loosening using lockwire wrapped through the fork and the safety wire tab on the handle.

(viii): With the rudder lock (1) disengaged, pull elevator to full up position. Verify that the rudder lock cannot be engaged by pulling down on the handle (39) while the elevator is up. While pulling down on the rudder lock handle, slowly lower the elevator to ensure that the lock does not engage until the lock mechanism cam is in front of the striker plate (36) and that the elevator does not jam at any point in its motion.

(ix): Reinstall the tail stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual. Install the rudder lock handle cover plate (33).

1.6 Condition Inspection:

(i): Remove the tail stinger/fairing assembly in accordance with paragraph 1.1 of this document.

(ii): Closely inspect the entire system for cracks, loose rivets, corrosion, and general condition.

a) If any cracks are found the rudder lock system should be removed and returned to Aero Twin, Inc. for repair/replacement.
b) Loose rivets can be replaced following standard practices.
c) Light surface corrosion can be can be cleaned up and the affected area re-coated. Corroded hardware should be replaced.

(iii): Check the release striker plate (36) on the elevator control horn for wear. If any part of the striker plate is worn to 0.025 inch or less thickness (from the original thickness of 0.032), remove the striker plate and install a new one:

a) Remove the two elevator control horn bolts and nuts holding the striker plate (36) on and remove the striker plate.
b) Install a new striker plate (36) on the elevator control horn using the existing bolts and nuts. Use new cotter pins (37), P/N MS24665-134.
c) Perform functional checks in accordance with paragraph 1.5 of this document.

Note: Wear of the striker plate indicates that the rudder lock has not been routinely disengaged using the handle - that the pilots have been disengaging the rudder lock using the elevator safety connection. If such is the case, the pilots should review the normal procedures described in the flight manual supplement provided with the kit.

(iv): Check the complete release linkage for signs of wear or rubbing. If the linkage exhibits excessive wear or sloppiness, the condition should be rectified by replacement of worn components, or by removing the entire rudder lock assembly and returning it to Aero Twin for service.

(v): Check the condition of the rudder strike plate (34) located at the bottom of the rudder. Replace if excessively worn or damaged. Follow standard sheet metal repair practices.

(vi): Apply a non-congealing corrosion block / lubrication product, such as *Corrosion-X™*, to the linkage and the entire lock body.

(vii): Reinstall the tail stinger/fairing assembly in accordance with the FAA approved Quest Maintenance Manual. Install the rudder lock handle cover plate (33).

(viii):Check that the rudder lock placard (41) on the side of the tail stinger/fairing and the placards (42) on either side of the nose gear fairing are legible and secure. Install new placards if needed.

1.7 General Operational Check

(i): Check operation by first securing the elevator with the control yoke lock, then engaging the rudder lock.

(ii): With the rudder lock engaged, the rudder should only move about ½ inch at its trailing edge.

(iii):Remove the elevator control yoke lock and pull back on the yoke. The rudder lock should disengage.

(iv): 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 striker plate on the rudder.

1.8 Weight and Balance

The rudder lock assembly adds 4.0 pounds at fuselage station 290.0, adding a moment of 1,160 in-lbs to the empty aircraft moment.

2.0 Airworthiness Limitations

Aero Twin, Inc. Rudder Gust Lock Kit No. QK-4111

The Airworthiness Limitations section is FAA approved and specifies maintenance required under paragraphs 43.16 and 91.403(c) of the Federal Aviation Regulations unless an alternative program has been FAA approved.

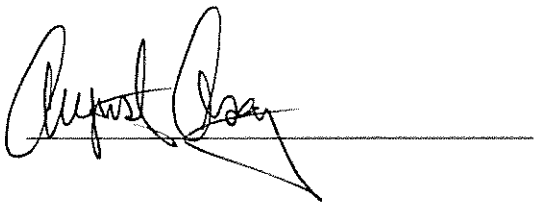
This section describes required inspections and maintenance. There are no scheduled replacement items. When repairs are deemed necessary, follow accepted standard practices and/or specific maintenance instructions in Section 1 of this manual.
This section constitutes Component Airworthiness Limitations which apply to the rudder gust lock installation only.

2.1 Scheduled Inspections and Maintenance:

The rudder gust lock assembly must be inspected every 200 flight hours. To inspect the mechanism:

1. Perform a Condition Inspection in accordance with paragraph 1.6 of this document.

2. Perform a General Operational Check in accordance with paragraph 1.7 of this document.

FAA Approval: 

----------End of Section 2.0 Airworthiness Limitations----------

3.0 Illustrated Parts List

Item	Qty	Part No.	Description	Figure
1	1	QK-4111-1	Lock Mechanism	3.1
2	1	QK-63322	Bulkhead	3.1
3	1	QK-63321	Doubler Attach Plate	3.1
4	6	MS20470AD6-12	Rivet	3.1
5	6	MS20470AD6-10	Rivet	3.1
6	8	MS20426AD4-5	Rivet	3.1
7	4	MS20426AD4-7	Rivet	3.1
8	2	AN3-4A	Bolt	3.1
9	3	AN3-5A	Bolt	3.1
10	2	AN970-3	Washer	3.1
11	11	NAS1149F0363P	Washer	3.1
12	2	MS21045-3	Nut	3.1
13	3	AN3-6	Bolt	3.1
14	3	AN310-3	Nut	3.1
15	3	MS24665-130	Cotter Pin	3.1
16	3	MS27975-4	Fork Fitting	3.2
17	3	MS35650-3252	Jamb Nut	3.2
18	1	QK-63323-2	Pushrod	3.2
19	1	QK-63325-5	Bellcrank	3.2
20	1	AN4-15	Bolt	3.2
21	5	NAS1149F0432P	Washer	3.2
22	4	S1450-4S10-032	Washer	3.2
23	2	NTA411	Bearing	3.2
24	2	S1003-11A	Bushing	3.2
25	1	AN310-4	Nut	3.2
26	1	MS24665-132	Cotter Pin	3.2
27	1	QK-63325-4	Angle	3.2
28	3	MS20470AD4-5	Rivet	3.1
29	1	QK-63324-4	Handle	3.2
30	1	QK-63329	Tailcone Doubler	3.1
31	8	AN525-10R10	Screw	3.1
32	1	MS35489-20	Grommet	3.1
33	1	QK-63328	Handle Cover Plate	3.1
34	1	QK-63326	Rudder Striker Plate	3.3
35	18	CR3243-4-3	Blind Rivet	3.3
36	1	QK-63327	Elevator Horn Striker Plate	3.1
37	2	MS24665-134	Cotter Pin	3.1
38	1*	QK-63323	Pushrod Assembly	3.1
39	1*	QK-63324	Handle Assembly	3.1
40	1*	QK-63325	Bellcrank Assembly	3.1

Illustrated Parts List continued on next page.

Item	Qty	Part No.	Description	Figure
41	1	QK-4111-PLAC	Placard - Rudder Lock Operation	3.4
42	2	AT-RL-1031	Placard - Do Not Tow	3.5
43	1	QK-63330	Brace – RH	3.1
44	1	QK-63331	Brace – LH	3.1
45	2	AN525-10R8	Screw	3.1
46	1	AN3-14A	Bolt	3.1
47	4	NAS1149F0332P	Washer	3.1
48	5	MS21042-3	Nut	3.1
49	5	MS20426AD4-4	Rivet	3.1

*Item 38 combines items 16 thru 18; item 39 combines items 16, 17, 29, and 32; item 40 combines items 19 thru 27. These parts may be ordered separately or as assemblies.

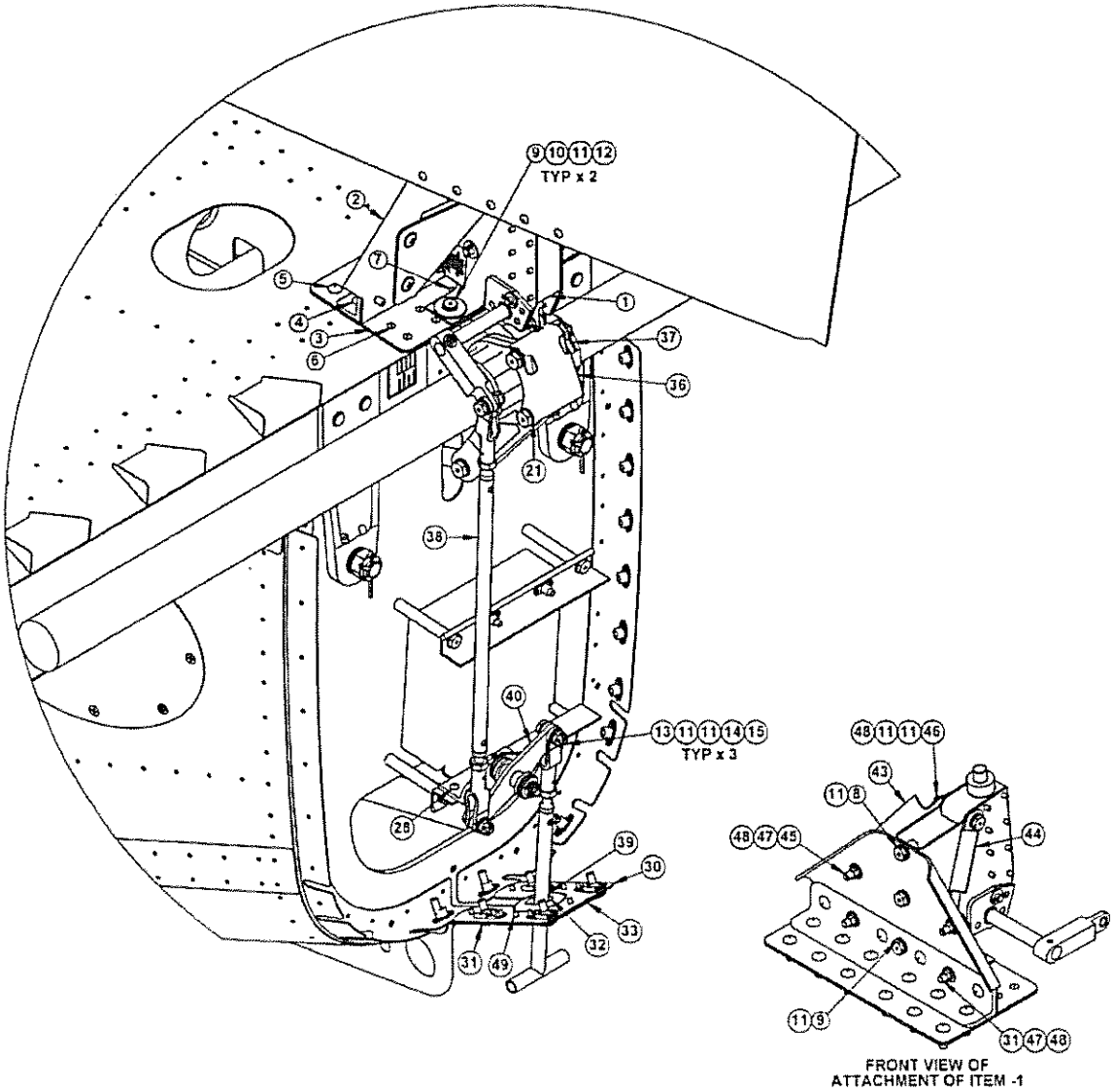
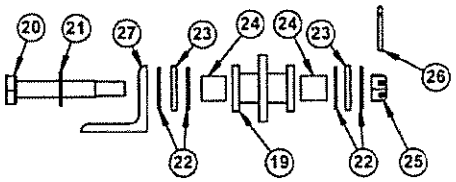
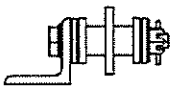


Figure 3.1 Rudder Gust Lock Installation

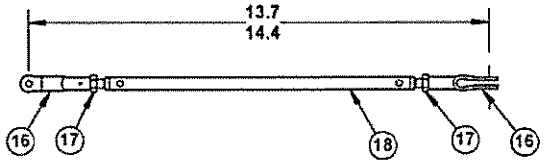


EXPLODED VIEW

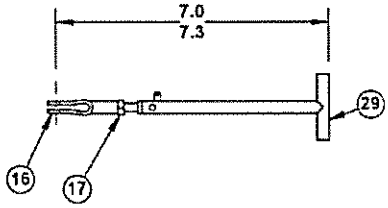


COLLAPSED VIEW

BREAKDOWN OF ITEM -40,
BELLCRANK ASSEMBLY



BREAKDOWN OF P/N QK-63323, PUSHROD ASSEMBLY



BREAKDOWN OF P/N QK-63324, HANDLE ASSEMBLY

Figure 3.2 Rudder Gust Lock Parts

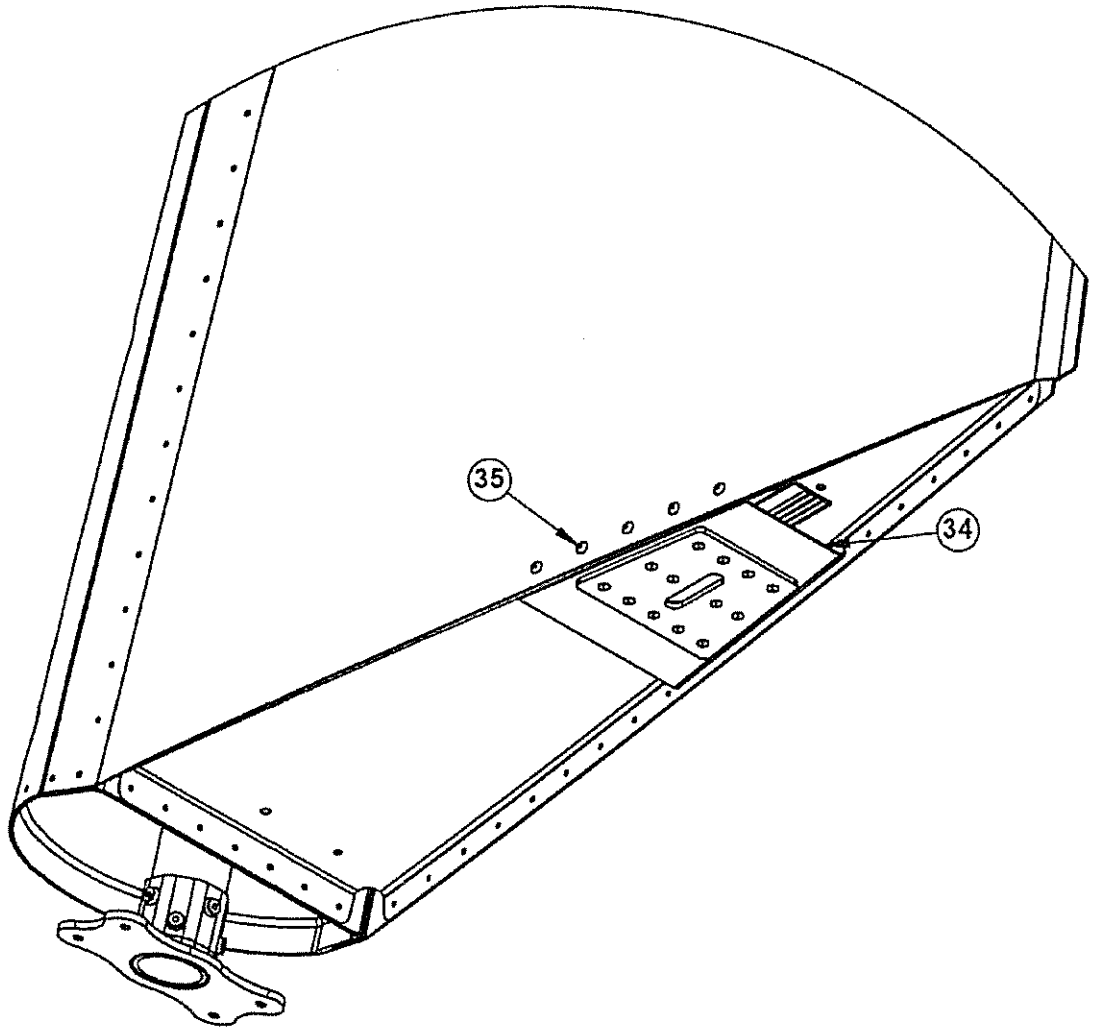


Figure 3.3 Rudder Striker Plate Installation

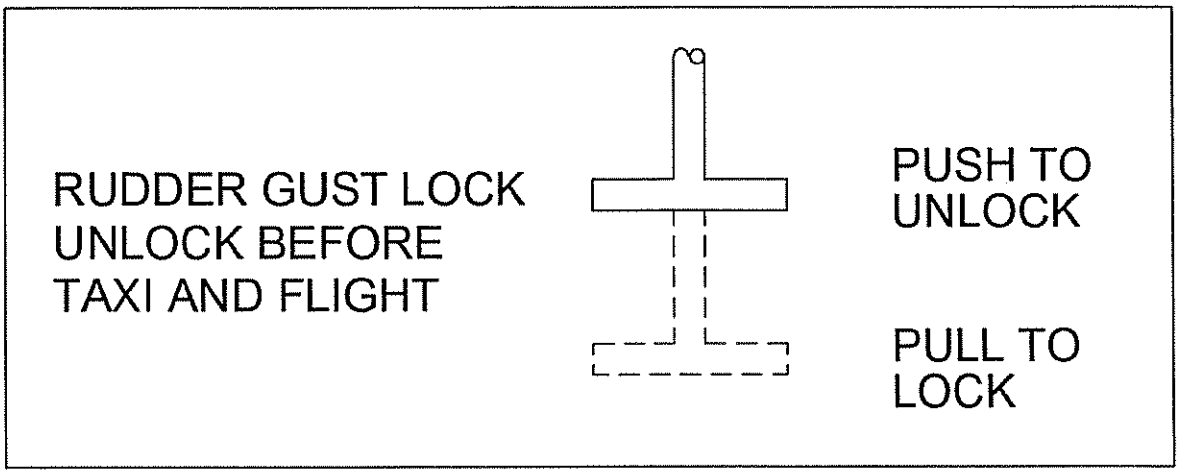


Figure 3.4 Rudder Gust Lock Operation Placard (Item 41)

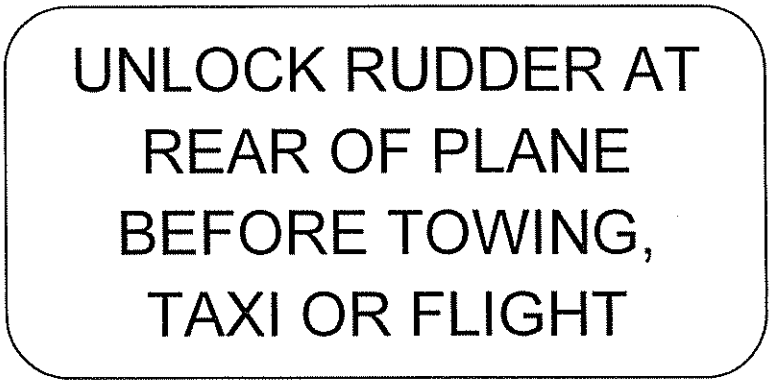


Figure 3.5 Do Not Tow Placard (Item 42)