RUDDER GAP SEALS

APPLICABLE MODELS

PIPER PA-24-400, PA-30/39

ISSUE DATE 03/24/82

KNOTS 2U, LTD.
709 AIRPORT ROAD
BURLINGTON, WI 53105
262 763-5100

REV #	DATE	EFFECT
A	07/04/99	Changed left side hardware, general cleanup. Added PA-24-400.

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RIGHT SIDE INSTALLATION ON PA-30 MODELS WITH PIPER AIRFLOW KIT 760-409

Aircraft equipped with Piper Airflow kit #760-409 are identified by a length of rubber running from the trailing edge of the vertical fin to the rudder on the right side. The existing retainer holding the seal in place is used for the installation of P/N RRS-2. The Piper Airflow kit was only installed on PA-30 models. If aircraft was not equipped with this Airflow Kit proceed to Section 2.

SECTION 1.0 LOCATING AND DRILLING HOLES IN P/N RRS-2

Remove all existing rudder seal screws from right side of vertical fin. Hold seal P/N RRS-2 up to vertical fin. Seal should overlap trailing edge of the vertical fin by 1" and be trimmed to meet the fuselage, as well as the top of the vertical fin. With seal properly located and using a hole finder, mark two random screw locations and drill using a #23 drill. Seal may be temporarily held in place while locating and drilling other screw locations.

SECTION 1.1 ATTACHING P/N RRS-2

When all hole locations are confirmed correct, drill all holes to a #23 hole size. De-burr and corrosion-proof all holes with Alodine or equivalent. Attach seal using removed sheet metal screws into old retainer.

SECTION 1.2 CONFIRMING PROPER MOVEMENT OF RUDDER

With seal P/N RRS-2 installed, move rudder through its full movement and check for binding on any rivet heads. If binding occurs seal can be "joggled slightly" with a needle nose pliers to prevent binding.

RIGHT SIDE INSTALLATION ON PA-24-400, PA-39, AND PA-30 MODELS WITHOUT PIPER AIRFLOW KIT

SECTION 2.0 LOCATING AND DRILLING FOR P/N RRS

With top of P/N TEMPLATE at top of vertical fin align TEMPLATE in its proper position. TEMPLATE should be located so it will provide ½" edge distance between center of holes and trailing edge of vertical fin. TEMPLATE should also be centered to leave an equal spacing at the top and bottom. With TEMPLATE in its proper position, mark and drill all holes in vertical fin to a #40 hole size. Confirm proper locations using P/N RRS and enlarge holes to a #18 hole size.

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SECTION 2.1 ATTACHING P/N RRS

De-burr holes and clean shavings from aircraft. Holes should be corrosion proofed with Alodine or equivalent. Place retainer P/N RET inside vertical fin so holes line up with holes drilled in vertical fin, hold temporarily in place. Place rudder seal P/N RRS on outside of vertical fin with holes matching those drilled. Using (20) AN526C632R8, secure rudder seal in place.

SECTION 2.2 CONFIRMING PROPER MOVEMENT OF RUDDER

With seal P/N RRS installed move rudder through its full movement and check for binding on any rivet heads. If binding occurs seal may be "joggled slightly" with a needle nose pliers to prevent binding.

LEFT SIDE INSTALLATION ON PA-24-400 AND PA-30/39 MODELS

SECTION 3.0 LOCATING AND DRILLING FOR LEFT SIDE RUDDER SEALS

With top of P/N TEMPLATE at top of vertical fin align TEMPLATE in its proper position. TEMPLATE should be located so it will provide ½" edge distance between center of holes and trailing edge of vertical fin. TEMPLATE should also be centered to leave an equal spacing at the top and bottom. With TEMPLATE in its proper position, mark and drill all holes in vertical fin to a #40 hole size. Confirm proper locations using P/N's LRB, LRH, LRC, AND LRT and enlarge holes to a #18 hole size.

SECTION 3.1 ATTACHING LEFT SIDE RUDDER SEALS

De-burr holes and clean shavings from aircraft. Holes should be corrosion proofed with Alodine or equivalent. Place retainer P/N RET inside vertical fin so holes line up with holes drilled in vertical fin, hold temporarily in place. Place rudder seals P/N LRB, LRH, LRC, & LRT on outside of vertical fin with holes matching those drilled. Using (20) AN526C632R8, secure rudder seal in place.

SECTION 3.2 CONFIRMING PROPER MOVEMENT OF RUDDER

With left side seals installed move rudder through its full movement and check for binding on any rivet heads. If binding occurs seal may be "joggled slightly" with a needle nose pliers to prevent binding.

PAPERWORK AND PARTS LIST

SECTION 4.0 PAPERWORK

Perform paperwork (337 and logbook entry). Place Supplemental Type Certificate and KNOTS 2U, LTD. Maintenance Manual with log books.

Rudder Seals and Hardware: .9 lbs.
Arm: Per appropriate Piper Service Manual

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SECTION 5.0 PARTS LIST

PA-30 MODELS WITH PIPER AIRFLOW KIT 760-409

PART #	QTY	DESCRIPTION
RRS-2	1	RIGHT RUDDER SEAL (NO HOLES)
RET	1	RETAINER
TEMPLATE	1	DRILLING TEMPLATE
LRB	1	LEFT RUDDER BOTTOM
LRH	2	LEFT RUDDER HINGE
LRC	1	LEFT RUDDER CENTER
LRT	1	LEFT RUDDER TOP
AN526C632R8	20	#632 X ½ S/S ROUNDHEAD MACHINE SCREW

PA-24-400, PA-39 AND PA-30 MODELS WITHOUT PIPER AIRFLOW KIT

PART #	QTY	DESCRIPTION
RRS	1	RIGHT RUDDER SEAL (W/HOLES)
RET	2	RETAINER
TEMPLATE	1	DRILLING TEMPLATE
LRB	1	LEFT RUDDER BOTTOM
LRH	2	LEFT RUDDER HINGE
LRC	1	LEFT RUDDER CENTER
LRT	1	LEFT RUDDER TOP
AN526C632R8	40	#632 X ½ S/S ROUNDHEAD MACHINE SCREW

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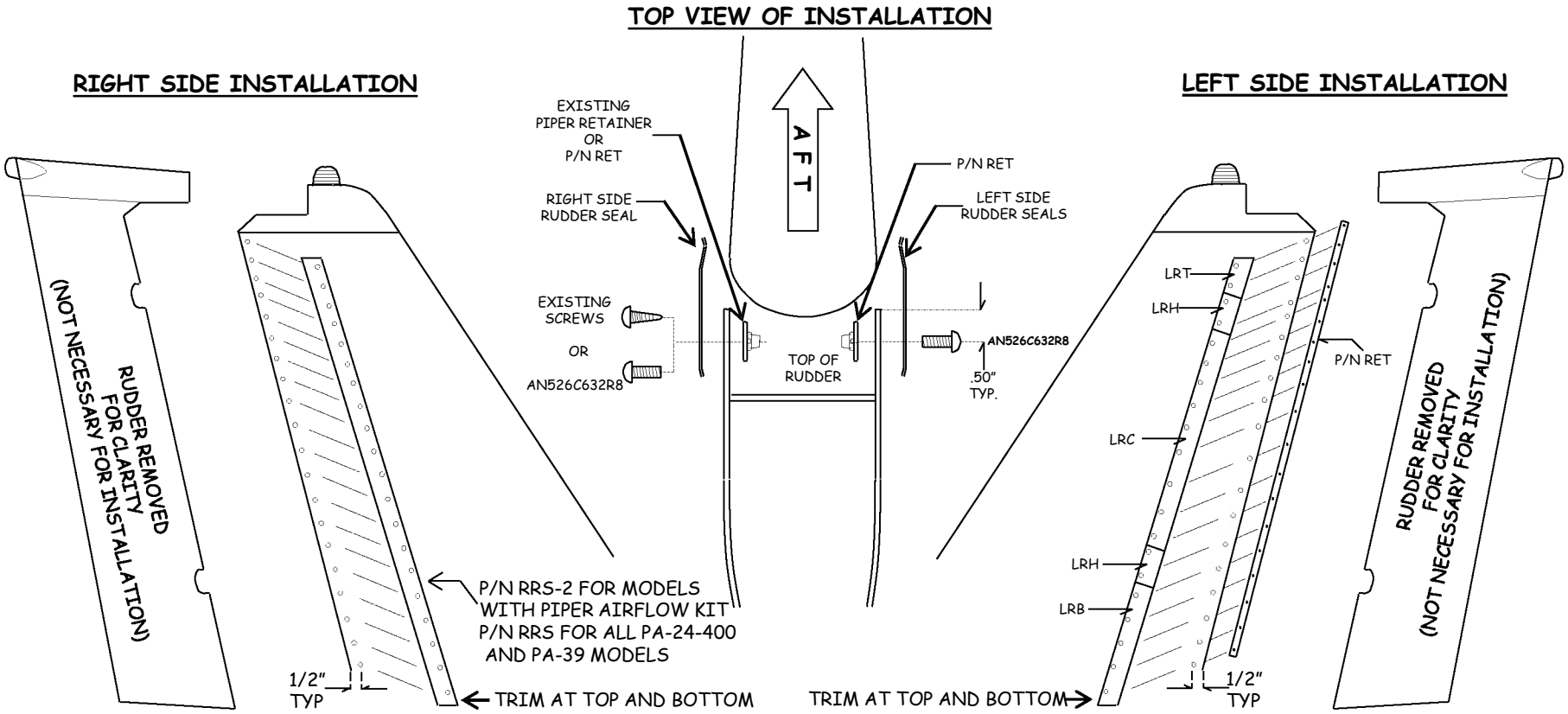
PA-24-400, PA-30/39 RUDDER SEAL INSTALLATION



REV.	DATE	EFFECT

KNOTS 2U, LTD.
703 AIRPORT ROAD, BURLINGTON, WI 53105

DRAWING # TCRS

PIPER PA-24-400, PA-30/39

07/04/99	NOT TO SCALE	DRAWN BY: JMB

DETAIL DRAWING PAGE 4

SECTION 7.0 MAINTENANCE MANUAL

K N O T S 2 U , L T D .

P I P E R P A – 2 4 – 4 0 0, P A – 3 0 / 3 9

R U D D E R G A P S E A L S

PART A. INSPECTION

1. Daily inspection at preflight to ensure there is no binding of controls, bent gap seals, abrading of rivets, control surfaces, or broken parts.
2. When aircraft has been stored outside during snow or freezing conditions, a careful inspection should be made of the areas behind and under the seals for ice accumulations. If ice is found that cannot be removed by careful brushing, the aircraft should be de-iced.
3. At 100 hour inspections it is suggested to check for abrading of rivets, control surfaces, and seals. Chafe tape should be inspected for peeling or excessive wear. Check all hardware and attachment of all seals.

PART B. MAINTENANCE

1. There are no special tools required to maintain the seals. Any tools needed are basic hand tools.
2. Maintenance of the Gap Seals is to keep the seal surface clean of oil and dirt, and the edge of the seal touching the control surface smoothly. If the Gap Seal appears to be abrading the control surface, 3M 5490 Teflon Tape or equivalent may be applied to the Gap Seal to act as a wear surface. The tape should be applied before further flight to prevent control wear.

3. If upon installation, or through wear, there is a warp in the seal or it lies unevenly, you may drill a #40 hole and cut the seal in a direction 90 degrees from the trailing edge. Drill the hole in the center of the warp, 1/2 inch from the trailing edge of the surface the seal is attached to. The cut in the seal should be trimmed to give a slot 1/16th" wide, with parallel edges. The slots should be no closer than 6 inches from each other or the end of the seal.

4. When aircraft is painted, care should be taken to prevent paint, paint remover, or solvents from contacting the Chafe Strip. If Chafe Strip is damaged, refer to PART B Paragraph 2 of this manual for replacement specifications.

PART C. CRACKING, DEFECTS, LOOSE RIVETS

1. If cracks are found in a Gap Seal, stop-drill the crack. If there are more than 3 cracks in a Gap Seal, the seal must be replaced.
2. If the Chafe Strip peels, 3M 5490 Teflon Tape, or equivalent, may be applied
3. If there are excessive bends or kinks in the seal, and the airflow over the control surface is disturbed, the seal must be replaced.

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United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA516GL

This certificate, issued to Knots 2U, Ltd.
3106 Bieneman Road
Burlington, WI 53105

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.* (See Type Certificate Data Sheet No. A1EA for complete certification basis).

Original Product — Type Certificate Number: A1EA

Make: Piper Aircraft Corporation

Model: PA-30, PA-39

Description of Type Design Change:

Installation of aileron, flap, flap to fuselage, and rudder gap seals; wing root fairings; dorsal fin; and engine nacelle in accordance with the appropriate manual identified in the Knots 2U, Inc. Installation Manual List Number SA516GL, dated July 4, 1987, or later FAA approved revisions.

Limitations and Conditions:

1. Any or all combinations of the above items are approved.
2. Compatibility of this design change with previously approved modifications must be determined by the installer.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 2/5/81

Date reissued: 12/16/81; 8/20/87; 5/29/90; 5/7/97

Date of issuance: 4/13/81

Date amended: 6/5/81; 5/6/82; 7/21/82; 8/14/87

By direction of the Administrator

Gregory J. Michalik, Senior Aerospace Engineer
(Signature)
Airframe & Administrative Branch
Chicago Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2 (10-68)

United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA526GL

This certificate, issued to Knots 2U, Ltd.
3106 Bieneman Road
Burlington, WI 53105

certifies that the change in the type design for the following product with the limitations and conditions thereof as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.* (See Type Certificate Data Sheet No. 1A15 for complete certification basis)

Original Product — Type Certificate Number: 1A15
Make: Piper Aircraft Corporation
Model: PA-24

Description of Type Design Change:

Installation of aileron, flap, flap to fuselage, and rudder gap seals; wing root fairings; and dorsal fin in accordance with the appropriate manual identified in the Knots 2U, Ltd. Installation Manual List Number SA526GL, dated July 4, 1987, or later FAA approved revisions.

Limitations and Conditions:

1. Any or all combinations of the above items are approved.
2. Compatibility of this design change with previously approved modifications must be determined by the installer.
3. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 2/5/81

Date of issuance: 6/9/81

Date reissued: 12/16/81; 7/21/82; 8/20/87; 5/29/90; 5/7/97; 1/21/99

Date amended: 5/14/82; 8/14/87

By direction of the Administrator

(Signature)

Gregory J. Michalik, Senior Aerospace Engineer
Airframe & Administrative Branch
~~Chicago Aircraft Certification Office~~
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