

APPLICABLE MODELS

PA-30 & PA-39

F A A
A P P R O V E D
513
JUN 17 1994

CHICAGO AIRCRAFT
CERTIFICATION OFFICE
CENTRAL REGION

KNOTS 2U, INC.
INDUCTION SYSTEM
INSTALLATION MANUAL
ISSUE DATE 12/25/93

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

REVISION PAGE

| REV# | DATE | PAGE | EFFECT |
|------|------|------|--------|
|------|------|------|--------|

FAA APPROVED

TABLE OF CONTENTS

| <u>SECTION No.</u> | | <u>PAGE No.</u> |
|--------------------|--|-----------------|
| 1.0 | = <i>RIGHT SIDE INSTALLATION</i> = | 1 |
| 1.1 | -REPLACING EXISTING AIR BOX | 1 |
| 1.2 | -INSTALLING EXISTING AIR OPENING COVER- | 1 |
| 1.3 | -LOCATING AND CUTTING INLET OPENING- | 1 |
| 1.4 | -LOCATING AND MARKING RIVET HOLES- | 1 |
| 1.5 | -AIR INLET FINISH AND ASSEMBLY- | 1 |
| 2.0 | = <i>FINAL ASSEMBLY</i> = | 1 |
| 2.1 | -ASSEMBLING AIR FILTER BOX- | 1 |
| 3.0 | = <i>LEFT SIDE INSTALLATION</i> = | 2 |
| 3.1 | -MIRROR POSITION & LEFT SIDE INSTALLATION- | 2 |
| 4.0 | = <i>FINAL TESTING</i> = | 2 |
| 4.1 | -GROUND TESTING- | 2 |
| 4.2 | -FLIGHT TESTING- | 2 |
| 5.0 | = <i>PAPERWORK</i> = | 2 |
| 6.0 | = <i>PARTS LIST</i> = | 2 |
| 7.0 | = <i>DETAIL #1</i> = | 3 |
| 8.0 | = <i>DETAIL #2</i> = | 4 |
| 9.0 | = <i>SUPPLEMENTAL TYPE CERTIFICATE</i> = | 5 |
| 10.0 | = <i>MAINTENANCE MANUAL</i> = | 6 |

FAA APPROVED

SECTION 1.0 =RIGHT SIDE INSTALLATION=**1.1 -REPLACING EXISTING AIR BOX**

Remove right cowl door from right engine. Remove air box, leaving bottom induction hose in place. Inspect bottom hose and clamps and alternate air mechanism and repair or replace parts as needed. Install *P/N 30AIR* Air Box at top end of bottom hose, clamping in place with existing hose clamp. This will prevent foreign objects from falling into induction servo. Re-install bolts and nuts in firewall to close holes.

1.2 -INSTALLING EXISTING AIR OPENING COVER-

Referring to Detail #2 install existing air opening cover *P/N EAOC* over the opening behind cylinder #3 using 4 *P/N AN3243-4-2* Cherrymax and #27 holes.

1.3 -LOCATING AND CUTTING INLET OPENING-

Referring to Detail #1 place Template *P/N 30AIRTMP* in position on right cowl door with lower trailing edge butted against inside lower trailing edge of cowl door doubler in which camlock fasteners are mounted. Trace the inlet opening onto the inside of cowl door. Remove template and cut out inlet opening. Use care at the leading edge of the inlet opening. The leading edge is not removed. The upper and lower edges of the leading edge are slotted so that the resulting tab may be bent inward to allow a smooth transition from the cowl door surface to the inlet opening. Remove template and place *P/N 30ID* Induction Inlet in position and check mating of the aluminum opening against fiberglass inlet. Trim and/or file the opening as required and adjust the leading edge tab to fit firmly against inlet ramp. Abrade the mating surfaces of the inlet and the cowl door to improve adhesion. Clean inlet and cowl door and apply 3M Scotch-Weld DP-190 Epoxy Adhesive, or equivalent, to the mating surface of *P/N 30ID*. Place inlet in position on cowl door and keep clamped together until firmly bonded.

1.4 -LOCATING AND MARKING RIVET HOLES-

Referring to Detail #1 locate fourteen (14) #30 holes observing indicated spacing and .5 inch edge distance from inlet. Countersink holes to 100 degrees.

1.5 -AIR INLET FINISH AND ASSEMBLY-

Remove shavings and install fourteen (14) *P/N AN426AD-4-4* rivets. Sand edges of opening smooth and apply body filler to leading edge tab, edges of inlet opening, and to fair trailing edge of inlet lip into surface of cowl door. Allow body filler to cure and sand all surfaces smooth to permit maximum airflow. Paint as required.

SECTION 2.0 =FINAL ASSEMBLY=**2.1 -ASSEMBLING AIR FILTER BOX-**

Referring to Detail #2 remove protective covering from *P/N BA4905* Filter and install in Air Box. Place *P/N 30MESH* Retainer in place on upstream side of the filter so that the edges will be held in place by the installation of the air box. Place cowl door in position to mount, with Induction Assembly attached, and fasten to *P/N 30ID* Air Inlet with *P/N 97-50-361-11* Draw Latches. Install *P/N AN415-2* Lock Pins in latches. It is possible to reach through the oil access door to help position and fasten the air box and lock pins. Fasten cowl door in place.

SECTION 3.0 =LEFT SIDE INSTALLATION=**3.1 -MIRROR POSITION & LEFT SIDE INSTALLATION-**

Remove circular mirror from right cowl door on left engine and repeat Sections 1.0 through 2.1 on left engine. Upon completion, position mirror on cowl door, aft of the induction inlet opening, so that the reflection of the nose gear can be seen from the pilot's seat.

4.0 =FINAL TESTING=**4.1 -GROUND TESTING-**

Run engines to confirm that maximum Manifold Pressure is available and that there are no obstructions to airflow. Shut down engines and check through the oil access door to confirm that the hose clamps and air box are intact.

4.2 -FLIGHT TESTING-

Confirm by flight test that the manifold pressures match, or exceed, Pilot's Operating Manual. If not, check alternate air and induction hose system.

=SECTION 5.0 PAPERWORK=

Perform paperwork (337 and log book entries). Place Supplemental Type Certificate and KNOTS 2U, INC. Maintenance Manual with log books.

Weight and balance change= Negligible

=SECTION 6.0 PARTS LIST=

| <u>PART NUMBER</u> | <u>NO. REQ</u> | <u>DESCRIPTION</u> |
|--------------------|----------------|---|
| 30AIR | 2 | AIR BOX |
| 30AIRTMP | 1 | AIR INLET TEMPLATE |
| 30ID | 2 | INDUCTION AIR INLET |
| 30MESH | 2 | STAINLESS STEEL WIRE MESH FILTER RETAINER |
| BA4905 | 2 | BRACKETT AIR FILTER |
| BA4910-01 | 2 | BRACKETT FILTER SCREEN |
| EAOC | 2 | EXISTING AIR OPENING COVER |
| AN3243-4-2 | 8 | CHERRYMAX RIVET |
| AN426AD-4-4 | 28 | RIVET |
| AN415-2 | 4 | LOCK PIN |
| DP190 | 1 | 1.7 OZ. TUBE SCOTCH-WELD EPOXY ADHESIVE |

FAA APPROVED

INLET OPENING AND INDUCTION INLET INSTALLATION DETAIL

EPOXY ADHESIVE APPLIED
BETWEEN INLET AND COWL DOOR

2 RIVETS AT AFT CORNERS
.5 MINIMUM EDGE DISTANCE

KNOTS
2U

P/N AN426AD-4-4
RIVET (14 REQ)

#30 HOLES .5 (CONSTANT) EDGE
DISTANCE FROM INLET OPENING

RIGHT COWL DOOR SHOWN,
TYPICAL FOR BOTH ENGINES

FAA APPROVED

#30 HOLES COUNTERSUNK 100°

3.75 (CONSTANT)
SPACING BETWEEN
INLET EDGE RIVETS

LEADING EDGE OF OPENING
HAS .5" SLOTS BENT INWARD AND
#30 STOP HOLES AT SLOT ENDS

P/N 30AIRTMP TEMPLATE
-AFT-

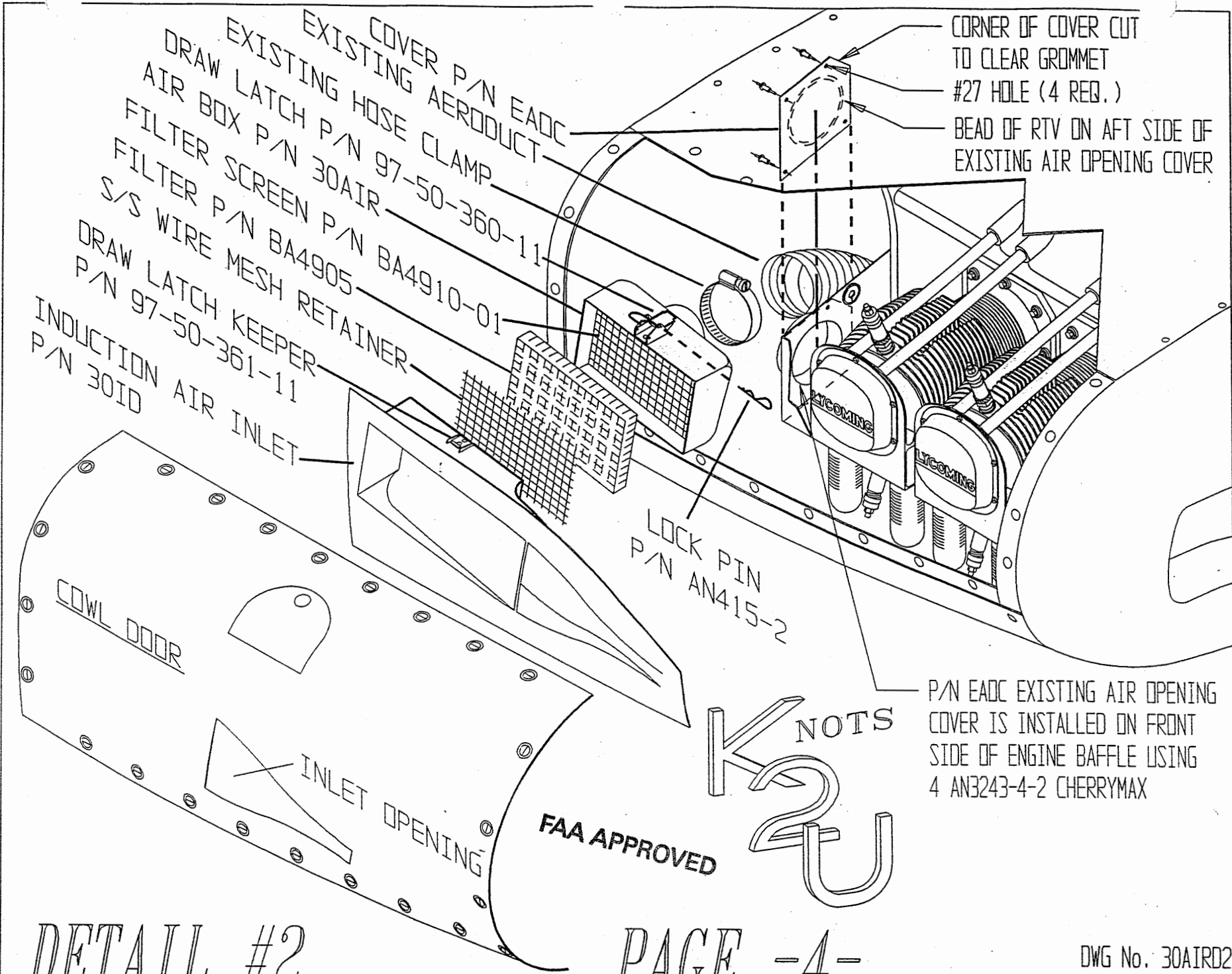
CUTOUT FOR INLET OPENING

ALINE AFT & BOTTOM EDGES OF
TEMPLATE WITH INSIDE EDGES OF
AFT & BOTTOM COWL DOOR DOUBLER

DWG No. 30AIRD1
12/25/93

DETAIL #1

PAGE -3-



DETAIL #2

PAGE -4-

DWG No. 30AIRD2
12-25-93

=SECTION 10.0 MAINTENANCE MANUAL=

KNOTS 2 U, INC.

PIPER PA 30 & PA 39

AIR INDUCTION SYSTEM

PART A. INSPECTION

1. During annual or 100 hour inspections, inspect air inlet attachment hardware, latches and clips for excessive wear or looseness. Inspect hose and hose clamp condition. Inspect air inlet and air filter box for cracks and filter screen for looseness. Check back side of foam element, it should look in almost new condition and show no signs of dirt. Inspect face of element for signs of backfire damage. If element has been on fire the face looks as if it has been eroded away.

PART B. MAINTENANCE

1. Filter element must be replaced every 12 months, regardless of actual flight time. If aircraft is operated in extremely dusty conditions replacement may be required as soon as 25 hours. Normal operation period for filter is 100 hours.
2. If the attachment hardware, lock pins, hose clamps, latches or induction hose is found to be excessively worn or loose during the 100 hour/annual inspection, it should be replaced. If the filter element shows signs of backfire damage it should be replaced prior to flight.
3. If the filter screen is loose it should be cemented in place using 3M DP190 Epoxy Adhesive, or equivalent.

PART C. CRACKING OR DEFECTS

1. If a crack is found in the air inlet box or air filter box, repair the crack according to FAR 43.131A Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair, Chapter 2.