

BLUE STAR CONVERSION

INSTALLATION OF CONTINENTAL IO-470-C OR IO-470-N

BEECH MODELS 35-33 THROUGH F-33

LWS 470-33

STC # SA5527SW

SAMPLE

REVISION 5

FEBRUARY 5, 1996

BLUE STAR CONVERSION

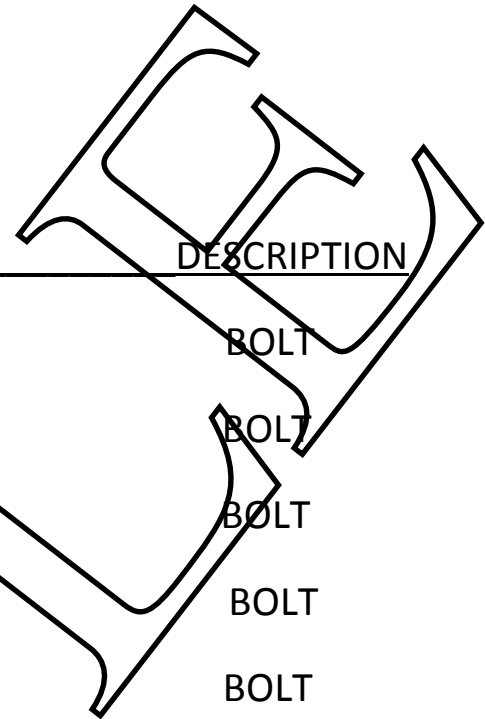
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LIST OF FASTNERS



PART NO.	DESCRIPTION
AN3-4	BOLT
AN3-4A	BOLT
AN3-7A	BOLT
AN3-15	BOLT
AN3-15A	BOLT
AN310-3	NUT
AN345-10	NUT
AN363-1032	NUT
MS-20365-832	NUT
MA-20365-1032	NUT
AN960-3	WASHER
AN960-8	WASHER
AN960-10	WASHER
AN515-832-20	SCREW
MS-20470AD-3-3	RIVET
MS-20470AD-4-4	RIVET

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INSTALLATION INSTRUCTION

Installing a Continental IO-470-C or -N engine in Beech models 35-33, 35-A33, 35-B33, 35-C33, E33 and F33.

1. Remove propeller and existing IO-470-J or -K engine from the airplane in accordance with Beech Shop Manual 35-5900096-B12, page 4-10B.
2. Remove the generator(alternator), vacuum pump and propeller governor from IO-470-J or -K engine. Save the existing attachment hardware.
3. OPTIONAL - Modify the existing aircraft cowling by incorporating adjustable cowl flaps using the following procedure.
 - a) Remove the existing fixed position cooling gills by drilling out the rivets attaching them to the cowling.
 - b) Plug the rivet holes in the cowling using MS-20470AD rivets of the same diameter as the rivets removed, gage the rivet length required.
 - c) Install the parts listed on page 5 (fig.1) as follows: At fuselage station 33.345 (the bulkhead immediately forward of the attachment point of the removed gills) locate the existing drilled pilot holes. Position the hinges, LH outboard Beech part no. 002-410026-7, LH inboard Beech part no. 002-410026-8, RH inboard 002-410026-9, RH outboard Beech part no. 002-410026-10 at the appropriate pre-drilled pilot holes. Drill through the bulkhead and hinges with a #30 drill using the pilot holes for position. Deburr the drilled components. Rivet the hinges to the bulkhead using MS20470-AD-4-4 rivets. Position gusset plates (see fig. 5) to the appropriate outboard hinge and stiffener angles by drilling through the existing pilot holes with a #30 drill. De-burr items. Attach the gusset plates to hinge bracket using MS-20470-3-3 rivets. Attach the gusset plates to the stiffener angles using MS20470-4-3 and -4-4 rivets.

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Installation Instructions (continued)

- d) Remove ends holding nose gear retraction mechanism in place. Install arm assembly. Beech part no. 35-944011 for models 35-33, 35-A33 and 35-B33 or arm assembly, Beech part no. 002-410052-1 for models 35-C33 or later. Install outside arm assembly, Beech part no. 002-410053-3. Install RH and LH cowl flap with AN hardware. Fit doors to openings for snug fit. Install rod links and ball joints.
- e) On CD-1 thru CD-387 remove cigarette lighter assembly located on right side of center console and install butt crimp on wire. Fabricate plate 1-1/2" by 2" out of .025 aluminum. Drill a 7/32" diameter hole in center of plate. Install plate over cigarette lighter hole with three CR2249-4-2 Cherry Lock rivets. Remove the plug in the firewall directly above existing plate, Beech part no. 35-944001-4, located on the right side of firewall. This is the outlet for the cowl flap control. Install cowl flap control, Beech part no. 35-380030-1 through instrument panel. Route control through hole in firewall. install block clamp, Beech part no. 35-944037 with item 43, 44, 45 and 46 in Figure 1. Rig cowl flaps in accordance with Beech Shop Manual 35-590096B-12, page 3-16C. Install placard as shown in Figure 1.
- f) On s/n CD-358 thru CD-1254, locate the flap switch on the control panel and drill a 7/32" diameter hole approximately two (2) inches to the left of the flap switch through the control panel. Install cowl flap control, Beech part no. 35-380050-1 at this location and route through hole in firewall (see paragraph "e")
- g) Verify the flap control cable installation does not interfere with the flight control system. Adjust the flap angle and control movement in accordance with Beech Shop Manual 35-590096-12, page 3-16C

h) REQUIRED ON ALL INSTALLATIONS WITH OR WITHOUT COWL FLAPS

INSTALLED Remove the engine access doors, Beech part no. 35-410460-5 LH and 35-410460-6 RH and install Louvers Beech part no. 002-410023-5 LH and 002-410023-6 RH, four on each door as shown in figure. **OPTION** - Install J.V.E. louvered cowling access panels per STC SA414CH.

Installation Instructions (continued)

4. Install the removed accessories from Continental IO-470-J or -K engine on the Continental IO-470-C or -N engine using retained hardware.
5. Assemble the exhaust system using components listed on page 6. Attach the two built up exhaust assemblies to the engine to be installed.
6. Install engine cooling baffles as shown in Figure 3, using parts listed on page 7.
7. Install the IO-470-C or -N engine assemble in the airplane using new cord mounts in accordance with Beech Shop Manual 35-590096-12, page 4-10B.
8. Required magnetos
 - a) Two Bendix S6RN-25 or S6RN-1225 or
 - b) One each Bendix S6RN-201, -205 or
 - c) One each Bendix S6RN-1201, 1205 (IO-470-N only) or
 - d) Two Slick 662 or 680 or
 - e) Two Slick 6210 (IO-470-C only)
9. Install the appropriate propeller assembly listed on pages ? in accordance with specifications shown.
10. Remark engine gauges and tachometer per applicable FAA approved flight manual supplement
11. Remove decals specifying 80/87 Octane fuel and install decals specifying "100 Octane Fuel" in the same locations.

Installation Instructions (Continued)

12. Revise the equipment list to show the installation of Continental IO-470-C or -N engine. Complete FAA form 337 showing engine installation in accordance with STC SA5527SW. Complete computed weight and balance or weigh aircraft to determine new aircraft empty weight and C.G. Make airframe logbook entry detailing engine removal and installation in accordance with STC SA5527SW, noting equipment list revision, date of FAA form 377, new empty weight and C.G. Revise the Airplane Flight Manual/Pilot's Operating Handbook by inserting appropriate Airplane Flight Manual Supplement.

SAMPLE

BLUE STAR CONVERSION
ENGINE COMPARTMENT AND COWL FLAP
PARTS LIST

Fig. 1

Item	Part No.	Description	Req'd
40	35-380050-1	Control Assembly	1
41	35-944037	Block, Clamp	2
43	112436-6	Retainer	1
44	112412	Grommet	2
45	112413-8	Ball	2
46	49338	Fastener	2
47	35-944001-4	Plate	1
48	B40-1	Ball Joint	5
49	002-410053-15	Link, Cowl Flap Control	2
50	002-410053-3	Arm Assy, Cowl Flap Control RH	1
51	35-944011	Arm Assy, Cowl Flap Control LH	1
	002-410053-1	Arm Assy, Cowl Flap Control LH	1
52	002-410025-13	Flap Assy, Cowl RH	1
53	002-410025-14	Flap Assy, Cowl LH	1
60	002-410026-7	Hinge, Cowl Flap LH Outbd	1
61	002-410026-8	Hinge, Cowl Flap LH Inbd	1
62	002-410026-9	Hinge, Cowl Flap RH Inbd	1
63	002-410026-10	Hinge, Cowl Flap RH Outbd	1
	002-410023-5	Louver, LH	4
	002-410023-6	Louver, RH	4

Fig. 4

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BLUE STAR CONVERSION
EXHAUST STACK PARTS LIST

Fig. 2

Item	Part No.	Description	Qty
42	35-950004-53	Stack Assembly, RH	1
	35-950004-63	Stack Assembly, LH	1
43	701-4	Heater	2
	701-5	Muffler	1
44	35-950004-9	Tube, Exhaust RH	1
	35-950004-7	Tube, Exhaust LH	1
44A	35-950004-17	Clamp Half	4
44C	AN3-4A	Bolt	8
	AN363-1032	Nut	8
	AN960-3	Washer	10
44D	AN3-15A	Bolt	6
	AN363-1032	Nut	6
	AN960-3	Washer	18
44G	35-910003-41	Clamp, Exhaust Support	2
44F	95-910019-13	Shroud	1

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BLUE STAR CONVERSION
ENGINE Baffles CONTINENTAL IO-470-N
PARTS LIST

Fig. 3

Item	Part No.	Description	Qty
1	35-910066-37	Baffle Assembly, Front LH	1
2	35-910215	Support, Forward Inter-Cylinder Baffle	2
3	35-910066-151	Baffle Assembly, Oil Cooler	1
4	35-910066-149	Baffle Assembly, Front RH	1
5	35-910066-227	Baffle Assembly, Front Inter-Cylinder LH	1
6	35-910066-233	Baffle Assembly, Front Inter-Cylinder RH	1
7	35-910066-11	Baffle Assembly, Rear Inter-Cylinder	2
8	35-910216	Support, Inter-Cylinder Baffle	2
9	45-910314-1	Clip, Angle	4
10	45-910314	Plate, Baffle Support	4
11	35-910066-157	Baffle Assembly, Rear LH	1
12	35-910066-33	Baffle Assembly, Rear RH	1
13	35-910066-251	Baffle Assembly, Rear	1
15	35-910066-207	Baffle Assembly, Oil Cooler	1
	002-410023-5	Louver, LH	4
	002-410023-6	Louver, RH	4

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BLUE STAR CONVERSION

Approved Propeller Installations
FAA TCDS 3A15

Item 3 (IO-470-C engine ONLY)
Beech constant speed propeller assembly installation

- a) Beech 278-100-7 Hub
with 278-214-82 blades
Diameter Maximum - 82 inches, Minimum - 81.5 inches
Pitch settings at 33 inch station:
Low: 13.5 degrees
High: Not under 30 degrees

- b) Woodward Governor (210235)

Item 4 (IO-470-C engine ONLY)
Beech constant speed propeller assembly installation

- a) Beech 278-100-7 Hub
with 278-213-82 blades
Diameter Maximum - 82 inches, Minimum - 81.5 inches
Pitch settings at 33 inch station:
Low: 13.5 degrees
High: Not under 30 degrees

- b) Woodward Governor (210235A) or later approved rev. letter

BLUE STAR CONVERSION

Approved Propeller Installations
FAA TCDS 3A15

Item 6 (IO-470-N Engine ONLY)

Beech constant speed propeller assembly installation

- a) Beech 278-100-11 or 278-100-13 Hub
with 278-214-82 blades
Diameter: 82 inches, No cut-off permitted.
Pitch settings at 33 inch station:
Low: 13.5 degrees
High: Not under 30 degrees

- b) Woodward Governor (210235 or 210350)

Item 9

Flottorp constant speed propeller installation

- a) Flottorp F12A-3 with 8400-2 blades
Diameter: Maximum: 82 inches
Minimum: 82 inches (IO-470-N), 81.5 inches (IO-470-C)
Pitch settings at 33 inch station
Low: 13.5 degrees
High: 30.0 degree minimum

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BLUE STAR CONVERSION

Approved Propeller Installations
FAA TCDS 3A15

Item 11

McCaughey constant speed propeller installation

a) McCaughey 2A36C23 Hub with 84B-0 Blades

Diameter: Maximum: 84 inches Minimum: 82 inches

Pitch Settings at 30 inch station

Low: 13.3 degrees (IO-470-N), 13.0 degrees (IO-470-C)

High: 29.2 degrees

b) Woodward governor (210452 or A210680)

c) McCaughey D3290A Spinner Assembly

d) Flottorp 1F1 (Garwin 34-825) governor

- McCaughey constant speed propeller installation

a) McCaughey 2A37C223 Hub with 90FB-6 Blades

Diameter Maximum - 84 inches Minimum - 82 inches

Pitch settings at 30 inch station

Low: 13.0 degrees (IO-470-C), 13.3 degrees (IO-470-C)

High: 29.7 degrees

b) Governor: McCaughey C290D3[x] 735, Woodward 210452, or A210680

RPM set to 2600 (IO-470-C), 2625 (IO-470-N)

- McCaughey constant speed propeller installation

a) McCaughey 3A34C423 Hub with 90DFA-10 Blades

- Install per instructions and specifications set forth in D'Shannon Products
STC SA1691G dated Jan. 14, 1992 or later FAA approved revision.

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BLUE STAR CONVERSION

Approved Propeller Installations

- Hartzell constant speed propeller installation

a) Hartzell PHC-L3YF-1RF Hub with F8468A-6R Blades

Diameter: not over 80 inches, not under 78.5 inches

Pitch settings at 30 inch station:

Low: 11.5 degrees +/- .1

High: 33.0 degrees +/- 1

b) Governor: McCauley C290D3[4]/T35, Woodward 210452, or
A210680 (2625 RPM)

c) Hartzell A-2295-1 Spinner Assembly

- Install propeller per Hartzell Owners manual #115N.

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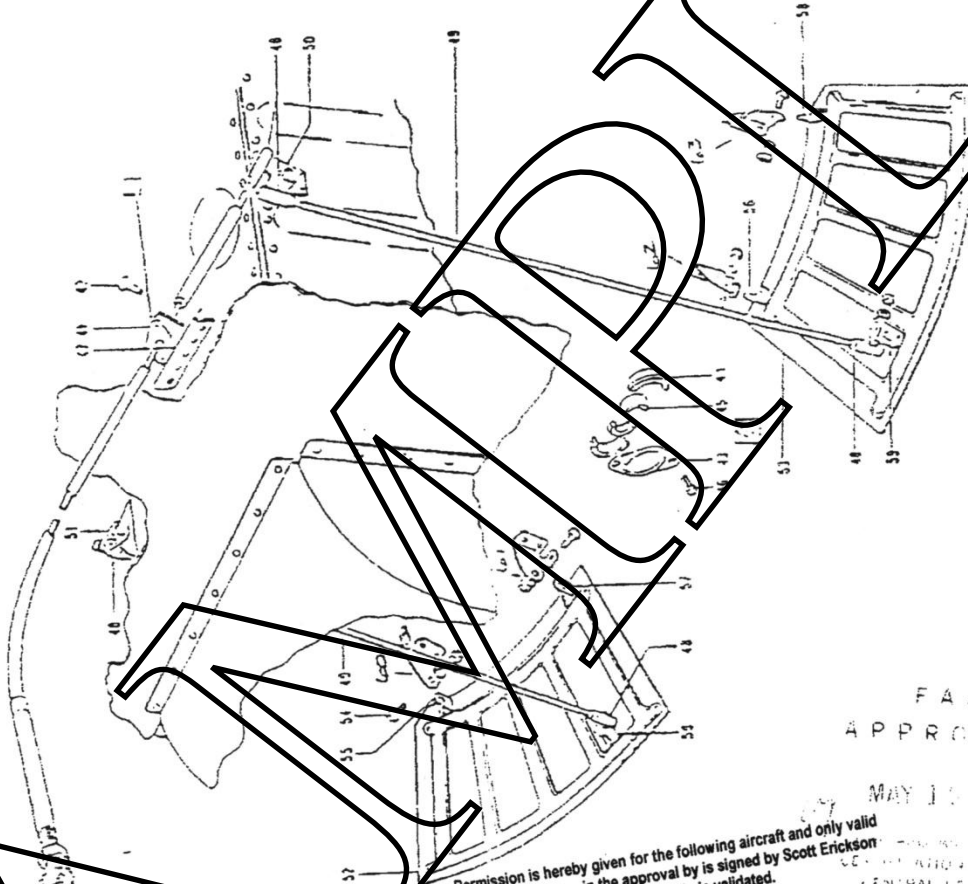
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R. 1

F A A
A P P R O V E D

MAY 10 1986

Permission is hereby given for the following aircraft and only valid when the signature in the approval by is signed by Scott Erickson and the return of the registration slip is validated.

Model _____ Call # _____ Serial # _____
Kit # _____ Approved By _____ Date _____

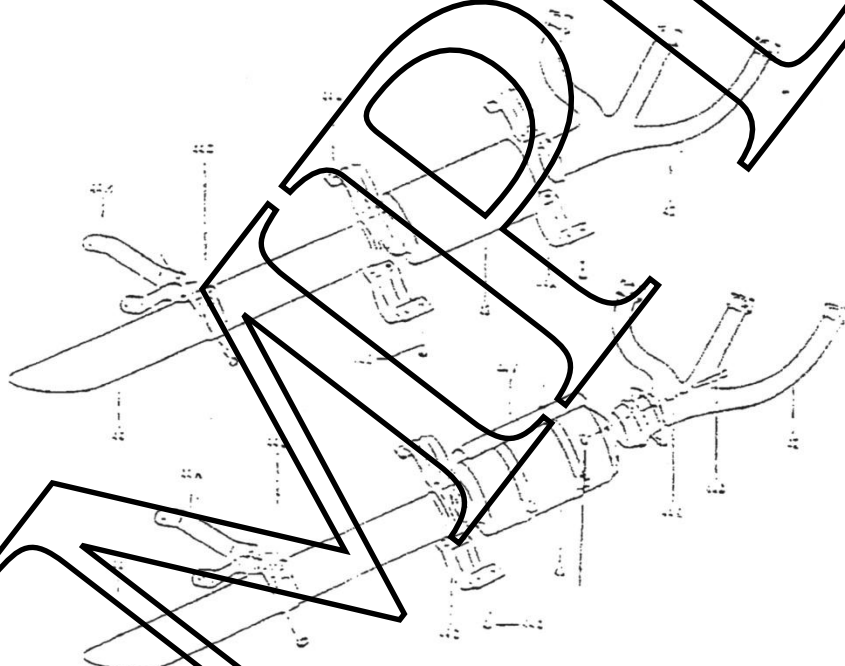
LAUREL

COMPL. FLAP

PULL OPEN

REV. 1
Date: Feb. Rev. 1982

SAMPLE



FAA
APPROVED

MAY 10 1996

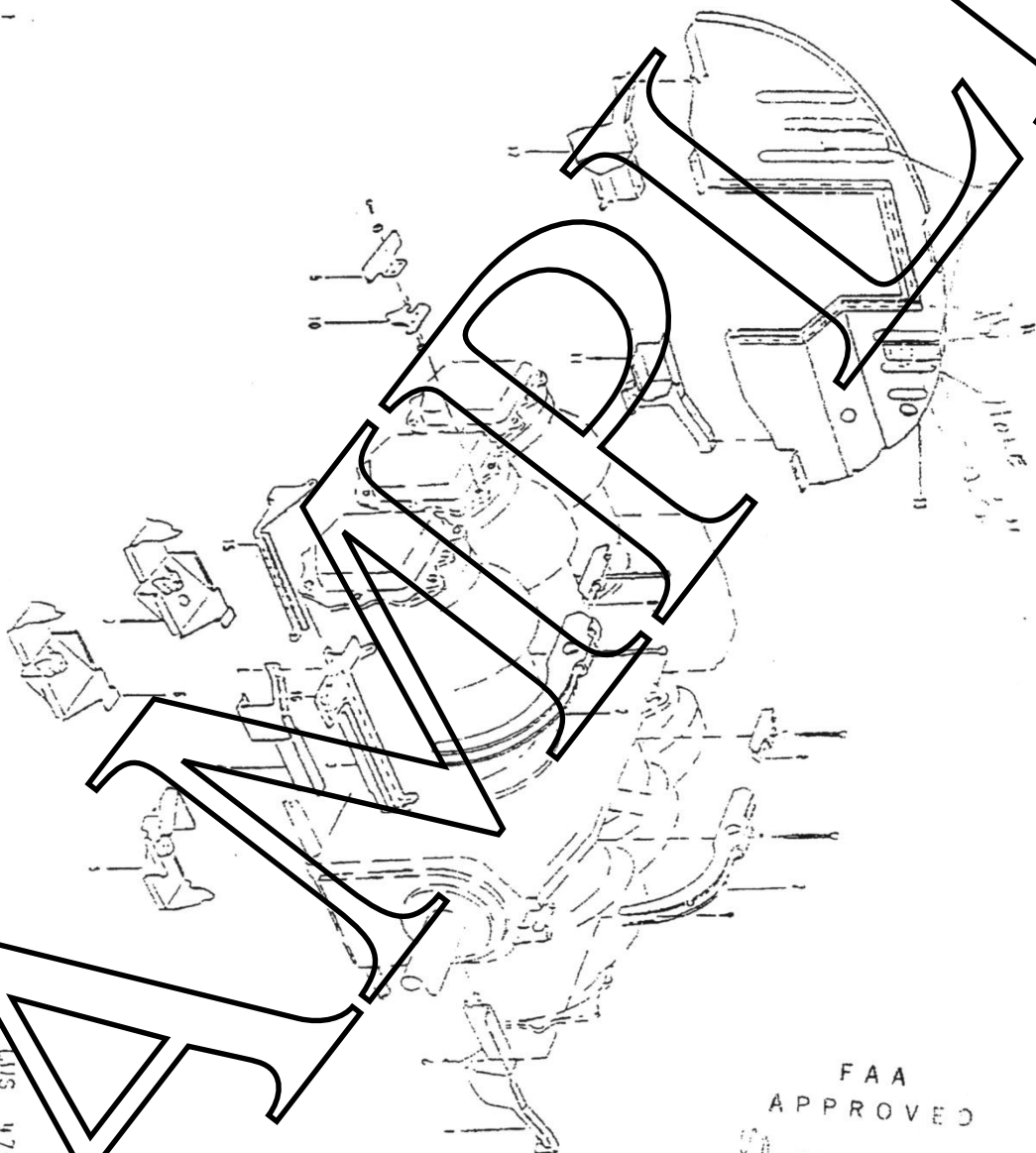
ONE HULL AIRCRAFT
REGISTRATION OFFICE
CENTRAL REGION

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Model _____ Call # _____ Serial # _____
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Rev _____
Date 14 Dec 1982

Rev 1
Date 14 Dec 1982



SAMPLE

LAIS 470-33
FIG 3

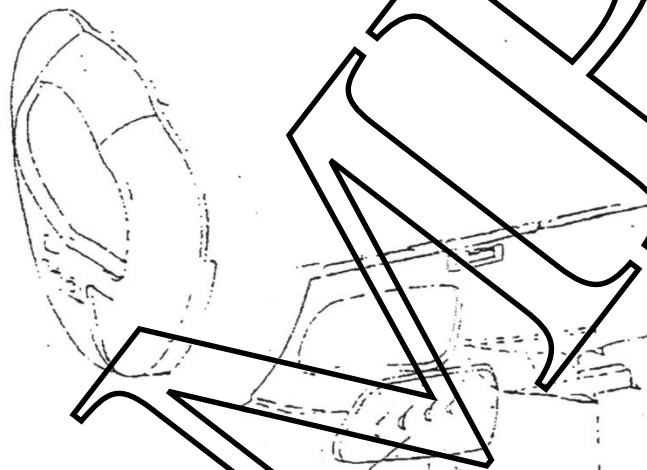
FAA
APPROVED
MAY 10 1996

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Model _____ Call # _____ Serial # _____
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LOUVER INSTALLATION
ENGINE ACCESS DOORS

SAMPLE



Louver
002-410023-5 LH
002-410023-6 RH

Engine Access Door
35-410460-5 LH
35-410460-6 RH

FAA
APPROVED

MAY 10 1996

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CENTRAL REGION

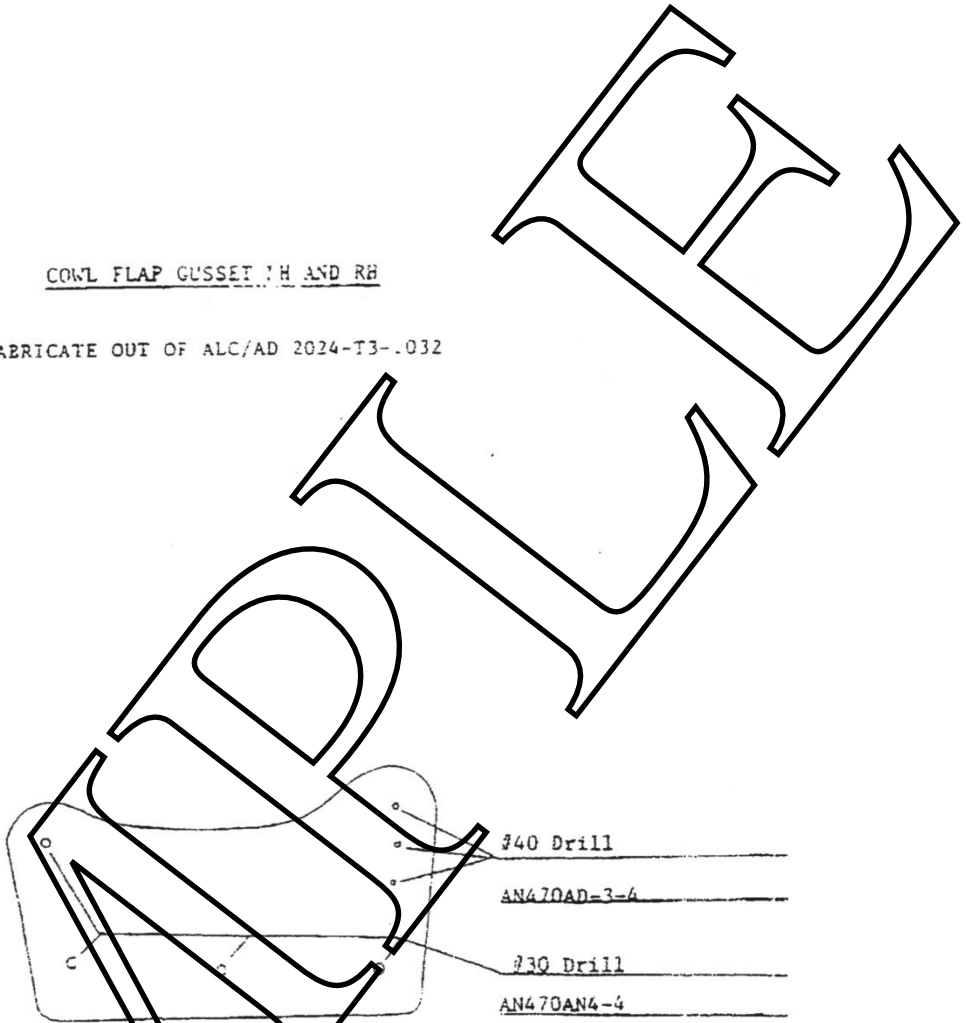
Model _____ Call # _____ Serial # _____
Kit # _____ Approved By _____ Date _____

Rev. 1
Date 14 Dec 1982

LWS 470-31
Fig 1

COWL FLAP GUSSET LH AND RH

FABRICATE OUT OF ALC/AD 2024-T3-.032



FULL SCALE

F A A
A P P R O V E D

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Model _____ Call # _____ Serial # _____

Fig. 5

Kit # _____ Approved By _____ Date _____

F A A A P P R O V E D :
Date 30 Aug 1983

SAMPLE

D'SHANNON PRODUCTS ENGINEERING ORDER

DATE 02/27/98	MODEL Beech 33	EFFECT ON LWS 470-33, Revision 5	E.C.O NUMBER E.C.O. LWS470-33-6
			E.O. TYPE DESIGN
			AUTHORITY ENGINEERING

PARTS MADE OK TO USE MAY BE REWORKED NOTED

DWG TO BE CHANGED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	E.C.O. By: M. TRUDEAU	RELEASE DATE 02/27/98
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TYPE	DOCUMENT NUMBER	REV.	TITLE	DRAWING DATE
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Inst. Man.	LWS 470-33	5	Blue Star Conversion, Installation of Continental IO-470-C or IO-470-M in Beech Model 35, 33 through F33.	Feb. 5, 1996 FAA App. May 10, 1996
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Add: Page 4, Number 8. Required Magnetos,
 or f. Two TCM S6RSC-25
 or g. One each TCM S6RSC-201, -205
 or h. Two Slick 6310
 or i. Two Slick 6380 (IO-470-N only)

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Model _____ Call # _____ Serial # _____
 Kit # _____ Approved By _____ Date _____

REFERENCED E.O. S

SAMPLE

D'SHANNON PRODUCTS ENGINEERING ORDER

DATE 02/27/98	MODEL Beech 33	EFFECT ON LWS 470-33, Revision 5	E.C.O. NUMBER EC/LWS470-33-5
		E.O. TYPE DESIGN	
		AUTHORITY ENGINEERING	

PARTS MADE OK TO USE MAY BE REWORKED NOTED

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TYPE	DOCUMENT NUMBER	REV	TITLE	DRAWING DATE
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Inst. Man.	LWS 470-33	5	Blue Star Conversion, Installation of Continental IO-470-C or IO-470-M in Beech Model 35-33 through F33.	Feb. 5, 1996 FAA App. May 10, 1996
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Add: Page 9(b) Eligible Propeller Installations

Note 1. Woodward model V210992 propeller governor is eligible for installation where this installation manual specifies that either a Woodward model 210452 and/or a A210680 propeller governor be installed. The model V210992 is a direct replacement for these older models. Adjust maximum RPM to that specified in the Flight Manual Supplement applicable to your installation. A factory new unit will come set at a maximum RPM of 2625. Turn max. RPM stop screw one turn clockwise for 2600 RPM installations.

REFERENCED E.O.'S

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Model _____ Call # _____ Serial # _____
 Kit # _____ Approved By _____ Date _____

S

D'SHANNON PRODUCTS ENGINEERING ORDER

DATE 03/06/98	MODEL Beech 33	EFFECT ON LWS 470-33, Revision 5 (STC SA5527SW)	E.C.O. NUMBER ECOLWS470-33-EC
		E.O. TYPE DESIGN	AUTHORITY ENGINEERING

PARTS MADE	OK TO USE <input type="checkbox"/>	MAY BE REWORKED <input type="checkbox"/>	NOTED
DWG TO BE CHANGED	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	E.C.O. By M TRUDEAU
			RELEASE DATE 03/06/98

TYPE	DOCUMENT NUMBER	REV.	TITLE	DRAWING DATE
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Inst. Man LWS 470-33 5 Blue Star Conversion, Installation of Continental IO-470-C or IO-470-N in Beech Model 35-33 through F33. Feb 5, 1996
FAA App. May 18, 1996

Add: Page 4:

13. Fuel pressure/flow indication is to be taken from the fuel divider on the top of the engine on this installation. The parts required are as follows:

1.	1	631658	90° Orifice Fitting (TCM)
2.	1	130524-4-0160	Hose Assembly (or equivalent)
3.	2	AN832-4	Straight Steel Bulkhead Fitting
4.	2	AN924-4	Steel Nut
5.	4	AN960-716	Washer
6.	1	130524-4-0130	Hose Assembly (or equivalent)
7.	1	130524-4-0170	Hose Assembly (or equivalent)
8.	1	AN816-4	Straight Steel Adaptor Fitting (AN816-4D aluminum fitting is acceptable). Adaptor is usually already in place in fuel pressure/flow indicator.
9.	1	MS21919DG11	Clamp
10.	1	AN520-10R20	Screw
11.	1	AN969-10	Washer
12.	1	MS20365-1032	Nut

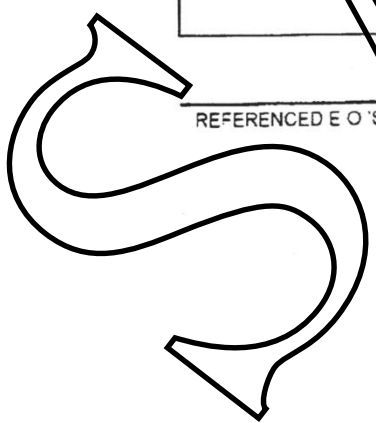
Install components as follows:

- Remove plug in aft side of fuel divider and install item 1.
- Drill a 7/16" hole in Rear Baffle Assembly below rubber seal maintaining a minimum 1/2" clearance from other lines/blast tube ports. Install 1 each item 3 and 4, and 2 ea item 5. Install item 2 (hose assembly) from fuel divider to bulkhead fitting. Secure item 2 (hose assy.) to fuel injection support assembly using items 9, 10, 11, and 12
- Install 1 each items 7 and 4, and 2 ea. Item 5, into firewall by drilling a 7/16" hole in the firewall near the fuel pressure gauge. When placing hole, assure that it does not interfere with other lines or wiring harnesses. Install item 6 (hose assembly between bulkhead fittings on baffle and firewall.
- If required install item 8 into fuel pressure/flow indicator inlet using appropriate sealing compound. Install item 7 (hose assembly) between firewall bulkhead and indicator.

REFERENCED E.O.'S

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Model _____ Call # _____ Serial # _____
 Kit # _____ Approved By _____ Date _____



D'SHANNON PRODUCTS

ENGINEERING ORDER

DATE J3/06/98	MODEL Beech 33	EFFECT ON LWS 470-33, Revision 5 (STC SA5527SW)	E.C.O. NUMBER ECOLWS470-33-6D
			E.O. TYPE DESIGN
			AUTHORITY ENGINEERING

PARTS MADE	OK TO USE <input type="checkbox"/>	MAY BE REWORKED <input type="checkbox"/>	NOTED
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DWG TO BE CHANGED	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	E.C.O. By: M. TRUDEAU	RELEASE DATE 12/15/99
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TYPE	DOCUMENT NUMBER	REV.	TITLE	DRAWING DATE
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Inst. Man.	LWS 470-33	5	Blue Star Conversion, Installation of Continental IO-470-C or IO-470-N in Beech Model 35-33 through F33.	Feb. 5, 1996 FAA App. May 10, 1996
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- a. Add: Additional Propeller Installations (page 9(b));
- McCauley Constant Speed Installation (3 blade)
- 3A36C434 hub with 80VEA-0 blades (Wt. 75.4 lb. @ +1
Diameter: Not over 80", not under 77".
Pitch Settings at 30" station: Low 10.8 degrees, High 33.9 degrees.
Governor: McCauley C290D(X)/T35, Woodward 210452, A210680, or V210992
(2625 - IO-470-N), (2600 - IO-470-C).
Spinner Assy. McCauley D-3600, or D-7062.
Install propeller per McCauley Manual No. MPC-11.

REFERENCED E.O.'S

