

TYPICAL WIRING DIAGRAM
ALTERNATOR SYSTEM, SINGLE AND TWIN ENGINE INSTALLATION

TROUBLE SHOOTING GUIDE

CONDITION OR FAULT	VOLTAGE MEASUREMENT TO GROUND			
	① <u>ALTERNATOR</u> <u>REG. Term.</u>	<u>REGULATOR</u> ② <u>REG. Term.</u> ③ <u>FIELD Term.</u>		④ <u>ALTERNATOR</u> <u>FIELD Term.</u>
NORMAL	1.0 ± 0.2	1.0 ± 0.2	1.0 ± 0.4	1.0 ± 0.4
1. BROKEN WIRE 2. OPEN FLD. SWITCH 3. OPEN OVR 4. OPEN BRUSH 5. FAULT ROTOR	7.5	7.5	7.5	0 7.5
REG. OPEN	9.0/11.5	9.0/11.5	0	0
REG. SHORTED	0.8	0.8	0.6	0.6
REG. WIRE OPEN (Broken wire or bad connection)	12.5	0	0	0
RESISTOR OPEN	0.4	0.4	0	0

1. Engine NOT running
2. Master switch "ON"
3. Field switch "ON"
4. Confirm that Alt. output term has 12.5 volts
5. Take voltage readings ① thru ④ to diagnose fault

Report 65-113

Belt - Beech P/H 53954

INSTALLATION INSTRUCTIONS

INTERAV ALTERNATOR

MODEL NO. 1255A

STC SA 334 SW



INTERAV INC.

P.O. BOX 16714 • 512-344-2785
100 E. NAKOMA DR. • SAN ANTONIO, TX. 78216

"Alum"

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FAA-DER APPROVED
MAY 11, 1981

REVISION G
MAY 11, 1981

AIRCRAFT INDEX

Aircraft Approved - STC SA334SW - September 15, 1975

Aircraft Designation

SINGLE ENGINE Refer to SECTION I for Installation Instructions

- Beech 23, all series
- *Beech 35, all series with Continental O-470/IO-470 engines
- *Beech H35, J35, K35, M35, N35, P35, 35-33, 35-A33, 35-B33, 35-C33
- Bellanca 14-19, all series with Continental O-470/IO-470 engines
- Cessna 180, all series
- Cessna 182, all series
- Cessna 185, all series
- Cessna 206
- Cessna 210, all series
- Cessna 210-5, all series
- Consolidated Aeronautics Colonial C1, C2, Lake LA-4, all series
- *Downer (Republic) RC-3
- Helio H250, all series with belt-driven generators
- *Hughes 269, all series with belt-driven generators
- Intermountain (Callair) A, all series with belt-driven generators
- Lockheed 402-2
- Meyers 200, all series
- Mooney M20, all series except those with IO-360 wide deck engines
- Navion D, E, F, G, and others with O-470 and IO-470 engines
- Piper PA-12, PA-12S,
- Piper PA-16
- Piper PA-18, all series with belt driven generators
- Piper PA-20, all series with belt-driven generators
- Piper PA-22, all series with belt-driven generators
- Piper PA-24, PA-24-250 engines
- Piper PA-25, all series
- Piper PA-28, all series

TWIN ENGINE Refer to SECTION II for Installation Instructions

- Camair 480
- Helio 500
- Pine Air (and) Fleet Aircraft Ltd. Super-V
- Piper PA-23, all series
- Piper PA-30

*See SECTION V For Supplemental Information

**See Section IV Optional Equipment and Spares List

United States of America
Department of Transportation - Federal Aviation Administration
Supplemental Type Certificate

Number SA334SW

This certificate issued to: InterAv, Inc.,
P. O. Box 16714
San Antonio, Texas 78216

confirms that the design of the following product with the limitations and conditions thereof as specified herein meets the airworthiness requirements of Part 3 of the Civil Air Regulations

Original Product - Type Certificate Number See Limitations and Conditions
Model See Limitations and Conditions
Model See Limitations and Conditions

Description of Type Changes Installation of InterAv Alternator in accordance with Report 65-113, Revision G dated 5/11/81, or later PAA or FAA DER approved revisions.

Limitations and Conditions

See attached Eligibility List dated July 30, 1981, FAA approved, for original type certificate numbers, makes, and models.

Compatibility of this modification with other 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 a new model is developed and shown to be in compliance with the requirements of the Technical Section of the Regulations.

Technical Section Information

Date of application January 8, 1964

Date of issuance February 3, 1964

7/27/84; 10/8/84; 12/8/84;
3/26/85; 9/16/85; 11/26/85;
1/19/86; 3/18/86; 5/3/86; 10/21/86; 9/15/87;
5/6/88; 11/22/88; 5/17/89; 5/4/81; 7/20/81;
Revision 16

By signing of the Representative

[Signature]
John P. Watson
Chief, Engineering and Manufacturing Branch



The validity of this certificate is provable by a file of not exceeding 1,000 or replacement for existing T-pics, as built

HINTS ON OPERATING YOUR ELECTRICAL SYSTEM

Alternators have different characteristics than DC Generators. Although the Alternator has several "built-in" safety features to protect its system, no mechanical devices can substitute for Good Operating Practices. To insure that your Alternator system will always render you dependable service, thoroughly familiarize yourself with the warnings listed below and see that these warnings are complied with. Failure to comply could result in damage to your electrical system.

DON'T open battery switch at any time that Alternator is operating!

DON'T operate Alternator with battery disconnected at any time.

DON'T turn battery switch "ON" when battery is being charged with battery charger.

DON'T use outside power source to start aircraft unless absolutely certain that polarity is correct. That is, positive to positive and negative to negative.

DON'T open Alternator circuit breaker at any time when Alternator is operating if manual-type circuit breaker is used. Leave in "ON" or closed position at all times.

DON'T install battery cables in reverse polarity. Connect positive lead to positive post and negative lead to negative post.

DON'T operate Alternator at any time with Alternator "OUTPUT" lead disconnected.

DON'T ground field terminal at any time Alternator is operating.

NOTE: To make Alternator inoperative when checking for radio noise, only the field circuit should be opened. On aircraft that do not have an individual switch for the Alternator field circuit (gen. switch), it will be necessary to disconnect the field lead at the Alternator and then run engine. (See SECTION III)

Section I

ALTERNATOR INSTALLATION BASIC INSTALLATION KIT #SE

Single Engine Aircraft

PARTS LIST

Quantity	Part Number	Ref. No.	Description
1 each	015-01237	A-152A	Alternator Assembly
1 each	625-61609	A-153 D	Voltage Regulator
1 each	635-62448	OVR-126	Overvoltage Relay
1 each	015-01240	A-167 D	Mounting Kit
1 each	245-23709	A-178	Spike Guard Capacitor
2 each	165-15041	A-178-2	Clamps
1 each	435-42408	A-178-4	Lead Kit
1 each	395-37992	A-178C	Hardware Kit
1 each	415-40054	OVR-12A-6	Placard
1 each		AR65-113	Installation Instructions

See Section IV Optional Equipment and Spares List

ALTERNATOR INSTALLATION

Instructions for Installation

Single Engine Aircraft

PART I: INSTALLATION OF ALTERNATOR AND REGULATOR

1. Disconnect battery, identify, mark, and disconnect original wires from generator and Regulator.
2. Remove Generator and Voltage Regulator.
3. Install Alternator, Part Number 815-01237, using existing generator mounting brackets. Install mounting bar with hardware supplied in kit, Part Number 815-01240. Use AN310-5 washers to adjust spacing between generator bracket and bar bracket. If front hole in bar is utilized, install short AN515A with two washers to prevent interference with AR8H15A belt.
4. Adjust for proper pulley alignment and install approved drive belt and adjust belt tension in accordance with standard procedures. Safety wire bolts together as required and safety AN8H15A bolt around support bar.
5. Install Voltage Regulator, Part Number 825-61609, where original regulator was mounted. Check that the free end of the bonding strap is well grounded to the airframe. Using hardware, clamps and leads, mount spike guard capacitor, Part Number 245-23709, to regulator as shown on diagram.
6. If original circuit breaker is rated less than 60 amp, remove and replace with Part Number 295-29694, 60 amp circuit breaker. Reconnect wires.
7. Connect the large wire removed from the generator output terminal, to the output terminal of the alternator, AC-43.13-1A, Chapter 11 covers in detail, wire size requirements to accommodate the 50 amp alternator output.
8. Connect the small wire removed from the generator field terminal to the field terminal of the alternator.
9. Install a bonding strap or a wire, as large or larger than, the original generator output wire, from the ground terminal of the alternator to the engine mount or engine case. Be sure you have a good ground between the alternator and the airframe.
10. Install an 18 ga. wire from the ground terminal of the alternator to the ground terminal of the voltage regulator.
11. Install an 18 ga. wire from the alternator reg. or (aux) terminal to the reg. terminal of the voltage regulator.
12. Connect the original field wire from the cabin generator field switch to the field terminal of the voltage regulator. Note that this wire was originally attached to the field terminal of the old regulator.
13. Splice the remaining two heavy wires which were connected to bat. and generator terminals of the original voltage regulator together using butt or ring type amp terminals of proper size.

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PART II: INSTALLATION OF OVERVOLTAGE RELAY

1. Install Overvoltage Relay, Part Number 635-62446 or 635-62448, in an area behind instrument panel which will provide clearance from other electrical component connections and clear of moving parts. Mount to convenient structure using No. 8 screws and nuts.
2. Install a 5 amp trip free circuit breaker such as MS24510-5 or equivalent.
3. Connect the wire marked "Pos" from the relay to the 5 amp circuit breaker.
4. Connect the wire marked "Gnd" from the relay to a good airframe ground.
5. At the field switch in the aircraft, disconnect the wire going to the Alternator field terminal and splice one of the two wires marked "Field" to the disconnected wire.
6. Connect the remaining "Field" wire to the terminal of the field switch vacated in Step 5.
7. Install placard, Part Number 415-40054, on instrument panel in view of pilot near alternator field switch.
8. Use ring and butt type terminals and splices such as amp 32951 and 321026 for all connections.
9. Insure all wires are properly secured and work is done in compliance with A.C.43.13-1A

PART III: PREPARATION OF FORM FAA 337

1. Install Alternator in accordance with Supplemental Type Certificate No. SA334SW. Weight Change: (Compute weight and balance as necessary). Check size of wire from Alternator output terminal to Alternator circuit breaker and from Alternator circuit breaker to buss and size of Alternator circuit breaker with A.C. 43.13-1A. (Note: Continue this statement as applicable. If wire and circuit breaker sizes are satisfactory, so state. If not satisfactory, state wire and/or circuit breaker size installed to conform with A.C. 43.13-1A.)
2. Modify aircraft equipment list by removal of generator listed and adding alternator installation.

WEIGHT: Alternator installation - 11 lbs

ARM: Refer to Aircraft Equipment List

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Section II

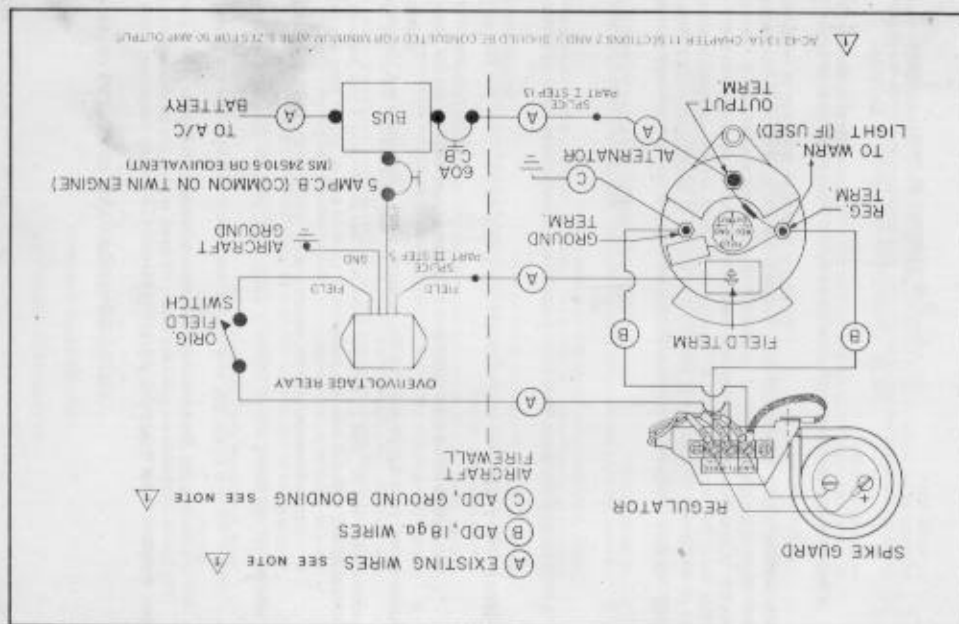
ALTERNATOR INSTALLATION
BASIC INSTALLATION KIT #TE

Twin Engine Aircraft

PARTS LIST

Quantity	Part Number	Reference No.	Description
2 each	015-01237	A-152A	Alternator Assembly
2 each	625-61609	A-153D	Voltage Regulator
2 each	635-62448	OVR-128	Overvoltage Relay
2 each	015-01240	A-167D	Mounting Kit
2 each	245-23709	A-178	Spike Guard Capacitor
4 each	165-15041	A-178-2	Clamps
2 each	435-42408	A-178-4	Lead Kit
2 each	395-37992	A-178C	Hardware Kit
1 each	415-40055	OVR-12A-7	Placard
1 each		AR65-113	Installation Instructions

See SECTION IV for Optional Equipment

TYPICAL WIRING DIAGRAM
ALTERNATOR SYSTEM, SINGLE AND TWIN ENGINE INSTALLATION

ALTERNATOR INSTALLATION

Instructions for Installation

Twin Engine Aircraft

PART I: INSTALLATION OF ALTERNATOR AND REGULATOR

1. Install Alternators and Regulators on each engine in accordance with instructions for Single Engine.
2. Remove paralleling relays and secure wires. The Alternator system does not require paralleling relays.

PART II: INSTALLATION OF OVERVOLTAGE RELAY

1. Install overvoltage relays for each engine in accordance with instructions for single engine.
2. Install placard, Part Number 415-40055, on instrument panel in view of pilot near alternator field switch.

PART III: PREPARATION OF FORM FAA337

Install Alternator in accordance with Supplemental Type Certificate No. SA334SW. Weight Change: (Compute weight and balance as necessary.) Check size of wire from right and left Alternator output terminals to right and left Alternator circuit breakers and from right and left Alternator circuit breakers to bus and size of right and left Alternator circuit breakers with A.C. 43.13-1A. (NOTE: Continue this statement as applicable. If wire and circuit breaker sizes are satisfactory, so state. If not satisfactory, state wire and/or circuit breaker size installed to conform with A.C. 43.13-1A.)

WEIGHT: Dual Alternator Installation weight - 22 lbs

ARM: Refer to Aircraft Equipment List

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SECTION III

RADIO NOISE SUPPRESSION TECHNIQUES

The Alternator system has built-in radio noise suppression, and virtually eliminates all noise and interference, on most installations. If additional suppression is required, a qualified Radio Maintenance Technician should be consulted for recommendations.

SECTION IV

OPTIONAL EQUIPMENT AND SPARES LIST

OPTIONAL EQUIPMENT

Req. Per Engine	Part Number	Reference No.	Description
1	295-29694	A-154	Circuit Breaker, 60 amp (KLIXONCLM60)
1	295-29699	A-200	Circuit Breaker, 5 amp (MS24510-5 or equivalent)
1	485-45923	A-168	Ammeter, 60 amp (SW359M)
1	015-01246	A-152-3	* Fan, Cooling, for opposite rotation engine
1	015-01245	A-179-1	Arm, Belt Adjust, PA-22

*Reference Fan/Alternator rotation from rear of Alternator. (Fan should pump air from inside Alternator.)

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Spares List

Req. Per Engine/Aircraft	Part Number	Reference No. (Old P/N)	Description
1	015-01237	A-152A	ALTERNATOR ASSEMBLY
1	245-23693	A-177-1	Capacitor
1	655-64139	A-152A-1	Resistor
1	115-09964	A-152-2	Brush Assembly
1	015-01247	A-152-4	FAN, COOLING, STANDARD ROTATION
1	015-01246	A-152-3	FAN, COOLING, for opposite rotation engine
1	015-01240	A-167D	MOUNT BAR ASSEMBLY W/HARDWARE
1	015-01245	A-179-1	Arm, Belt Adjust, PA-22
1	625-61609	A-153 D	VOLTAGE REGULATOR ASSEMBLY
1	625-61610	A-153-3	Strap, Grounding
1	245-23810	A-178A	SPIKE GUARD ASSEMBLY
1	245-23709	A-178	Capacitor
2	165-15041	A-178-2	Clamp
1	435-42371	A-178-1	Lead Assembly 3.5"
1	435-42372	A-178-3	Lead Assembly 5.5"
1	395-37992	A-178C	Hardware Kit
1	635-62448	OVR-128	OVERVOLTAGE RELAY
1	415-40054	OVR-12A-5	Placard, Single Engine
1	415-40055	OVR-12A-7	Placard, Twin Engine

*REFERENCE FAN/ALTERNATOR ROTATION FROM FROM REAR OF ALTERNATOR. FAN SHOULD PUMP AIR FROM INSIDE ALTERNATOR

REMANUFACTURED EXCHANGE

PART NO.	REF. NO.	DESCRIPTION
015-01248	A-152-A	ALTERNATOR ASSEMBLY

Section V

SUPPLEMENTAL INFORMATION

- Bonanza Aircraft S/N's 04886 through 08162
- Contra Rotating Engines and Fan Rotation
- Piper PA 24-238 Belt Recommendations
- Lycoming Wide Deck Engines
- Dowser (Republic) RC-3 Seabee, Franklin 6A8-215

- Compliance with the following excerpt from (BEECHCRAFT SERVICE NEWS), Vol. XIII, No. 2, Feb. 1960 is recommended when an INTER AV Alternator kit is retrofitted to Bonanza Aircraft.

"SHOCK MOUNTED GENERATOR BRACKETS - A new shock mounted generator bracket which will reduce vibration, the major cause of premature generator and generator bracket failures, has been developed for the Continental O-470 and IO-470 series engines. The shock mounted generator bracket is available for installation on the Bonanza series of airplanes, serials D-4806 through D-6161. Installation of this new bracket will be made at the factory on all Model 33 aircraft and on Bonanzas, serials D-6162 and after. This improved bracket assembly was developed by Continental Motors and is available in Continental kit EQ-5841. The kit consists of four rubber shock mounts, a new generator brace, a new mounting bracket, attach parts, and installation instructions. Further information concerning Kit EQ-5841 or the kit itself may be obtained by contacting the Continental Motors Corporation of Muskegon, Michigan or any authorized Continental Distributor."

NOTE: It is our understanding that the kit mentioned in the above excerpt is no longer available as a kit, but individual parts are currently available from Tolexwye Continental Motors through their customer service department in Mobile, Alabama. (See Generator and Brackets, Models IO-470 C, through S in Continental Motors Book.)

- Installation of Alternators on aircraft equipped with Counter-Rotating Engines:

An opposite rotation fan, Part Number 815-01246, is available from the factory on an exchange basis at no charge. Remove the Part Number 815-01247 fan from the Alternator to be installed on the opposite rotation engine and replace with Part Number 815-01246 fan.

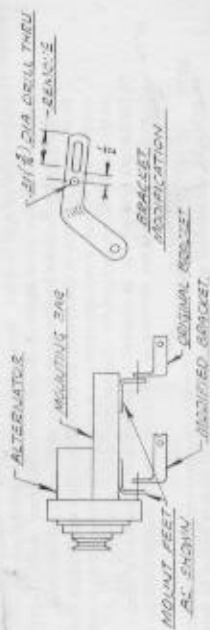
- Piper PA-24-250 Belt Recommendations - Gates Belt P/N's 675TG (31"), 8353 (31-1/8") or 8242 (32-1/8").

- STC SA334SW is approved for installation on those aircraft listed on Page 2 using the "narrow deck" Lycoming engines. Later versions of some aircraft will have the "wide deck" Lycoming engine installed. Check with your local GAO for assistance with field approval to install this alternator system on wide deck Lycoming engines.

INTER A INC. ALTERNATOR INSTALLATION

This is an illustration of one method of mounting the Alternator. Other methods may be employed at the discretion of the installing agency, provided that installation conforms with instructions outlined in Report 68-111 (single engine).

1. In order to properly align the alternator with it will be necessary to modify the existing front generator steel mounting bracket by drilling one $5/16"$ hole $1/2"$ ahead of the slot. Cut the slotted end off and re-install the bracket on the engine, using the same cap screw.
2. Assemble the alternator feet on the alternator mounting bar and install the feet on the front side of the original generator brackets, using the original bolts, as shown on the sketch.



5. The generator belt tension adjustment bar is turned upward and attached to the threaded hole in the alternator, nearest the engine case. It may be necessary to add washers to the lower end of the bar in order to align the bar with the alternator. In the event your belt adjustment bar is the long type, drill new hole in bar as per sketch and cut off excess material.
Use Franklin P/N 14883 or Goodyear 51380 Belt.

