A-178 SPIKE GUARD

A-153C REGULATOR

A-152A ALTERNATOR

FIELD TERM.

FIELD TERM.

GROUND TERM.

TO WARN. LIGHT (IF USED)

AC-43.13-1A CHAPTER 11 SECTIONS 2 AND 3 SHOULD BE CONSULTED FOR MINIMUM WIRE SIZES FOR 50 AMP OUTPUT.

EXISTING WIRES SEE NOTE

ADD, 18 GA. WIRES

ADD, GROUND BONDING SEE NOTE

AIRCRAFT FIREWALL

OVR-12B RELAY

ORIG. FIELD SWITCH

-.5 AMP C.B. (COMMON ON TWIN ENGINE)

60A C.B.

BUS

TO A/C BATTERY

TYPICAL WIRING DIAGRAM

ALTERNATOR SYSTEM, SINGLE AND TWIN ENGINE INSTALLATION
<table>
<thead>
<tr>
<th>CONDITION OR FAULT</th>
<th>1. ALTERNATOR REG. Term</th>
<th>2. REGULATOR REG. Term</th>
<th>3. FIELD Term</th>
<th>4. ALTERNATOR FIELD Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>1.0 ± 0.2</td>
<td>1.0 ± 0.2</td>
<td>1.0 ± 0.4</td>
<td>1.0 ± 0.4</td>
</tr>
<tr>
<td>1. Broken Wire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Open Fld. Switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Open Overload</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>0</td>
</tr>
<tr>
<td>4. Open Brush</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Fault Rotor</td>
<td></td>
<td></td>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td>Faulty Regulator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg. Open</td>
<td>9.0/11.5</td>
<td>9.0/11.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reg. Shorted</td>
<td>0.8</td>
<td>0.8</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Reg. Wire Open</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Broken wire or shorted)</td>
<td>12.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Resistor Open</td>
<td>0.4</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
INSTALLATION INSTRUCTIONS

INTERAV ALTERNATOR

MODEL NO. 1255A

STC SA 334 SW

INTERAV INC.

P.O. BOX 15714 - 512-344-2785
100 E. NAKOMA DR. - SAN ANTONIO, TX 78216
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRCRAFT INDEX</td>
<td>2</td>
</tr>
<tr>
<td>SUPPLEMENTAL TYPE CERTIFICATE SA334SW</td>
<td>3</td>
</tr>
<tr>
<td>HINTS ON OPERATING YOUR ELECTRICAL SYSTEM</td>
<td>4</td>
</tr>
<tr>
<td>SECTION I Basic Single Engine Kit</td>
<td>5</td>
</tr>
<tr>
<td>SECTION II Basic Twin Engine Kit</td>
<td>9</td>
</tr>
<tr>
<td>SECTION III Radio Noise Suppression</td>
<td>11</td>
</tr>
<tr>
<td>SECTION IV Optional Equipment and Spares List</td>
<td>11/12</td>
</tr>
<tr>
<td>SECTION V Supplemental Information</td>
<td>13/14</td>
</tr>
</tbody>
</table>
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 35, .36, .36, M35, N35, P35, 36-33, 36-A31, 36-B33, 36-C31
Bellanca 14-15, all series with Continental O-470/IO470 engines
Cessna 180, all series
Cessna 182, all series
Cessna 185, all series
Cessna 206
Cessna 210, all series
Cessna 210J, all series
Consolidated Aerocar/Nestor C1, C2, Lake LA-4, all series
* Dornier (Germany) DO-3
** Hughes 200, all series with belt-driven generators
** Intercopter (Canada) A, all series with belt-driven generators
Lockheed 4022
Meyers 200, all series
Mooney M20, all series except those with O-360 wide chord engines
Navion D, E, F, G, and others with O-470 and IO-470 engines
Piper PA-12, PA-1255, PA-18
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

Camar 480
Helen 500
Fine 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
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 Practice. 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)
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 015-01237, using existing generator mounting bracket.
   Install mounting bar with hardware supplied in kit, Part Number 015-01260.
   Use AN670-5 washers to adjust spacing between generator bracket and bar bracket. If front
   hole in bar is utilized, install short AN631A with two washers to prevent interference with
   AN813A bolt.
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
   AN813A bolt around support bar.
5. Install Voltage Regulator, Part Number 622-61660, where original regulator was mounted.
   Check that the tab end of the bending strap is well grounded to the airframe. Using
   hardware, clamps and leads, mount side guard capacitor, Part Number 265-13780, to
   regulator as shown on diagram.
6. If original circuit breaker is rated less than 60 amp, remove and replace with Part Number
   295-35664, 60 amp circuit breaker. Reconnect wires.
7. Connect the large wire removed from the alternator output terminal to the output
   terminal of the alternator. AC-43.13-1A, Chapter 11 covers in detail, wire size require-
   ments to accommodate the 60 amp alternator output.
8. Connect the small wire removed from the generator field terminal to the field terminal
   of the alternator.
9. Install a bending 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 wires 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 bar, and generator
    terminals of the original voltage regulator together using butt or ring type amp terminals
    of proper size.

PART II: INSTALLATION OF OVERVOLTAGE RELAY

1. Install Overvoltage Relay, Part Number: 635-52448 or 335-52448, in an area behind instru-
   ment panel which will provide clearance from other electrical component connections
   and clear of moving parts. Mount in 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 "Neg." from the relay to a good airflow 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 A15-60094, 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 wires
   from Alternator output terminal to Alternator circuit breaker and from Alternator
   circuit breaker to bus 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
Section II
ALTERNATOR INSTALLATION
BASIC INSTALLATION KIT #TE

Twin Engine Aircraft

PARTS LIST

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part Number</th>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 each</td>
<td>016-001273</td>
<td>A-163A</td>
<td>Alternator Assembly</td>
</tr>
<tr>
<td>2 each</td>
<td>026-61609</td>
<td>A-153D</td>
<td>Voltage Regulator</td>
</tr>
<tr>
<td>2 each</td>
<td>035-62488</td>
<td>OVR-12B</td>
<td>Overvoltage Relay</td>
</tr>
<tr>
<td>2 each</td>
<td>015-001240</td>
<td>A-167D</td>
<td>Mounting Kit</td>
</tr>
<tr>
<td>2 each</td>
<td>045-23709</td>
<td>A-178</td>
<td>Spike Guard Capacitor</td>
</tr>
<tr>
<td>4 each</td>
<td>165-15061</td>
<td>A-17B-2</td>
<td>Clamps</td>
</tr>
<tr>
<td>2 each</td>
<td>439-62408</td>
<td>A-17B-4</td>
<td>Lead Kit</td>
</tr>
<tr>
<td>2 each</td>
<td>305-37022</td>
<td>A-17C</td>
<td>Hardware Kit</td>
</tr>
<tr>
<td>1 each</td>
<td>413-60556</td>
<td>OVR-12A-7</td>
<td>Places</td>
</tr>
<tr>
<td>1 each</td>
<td>AR65-113</td>
<td></td>
<td>Installation Instructions</td>
</tr>
</tbody>
</table>

See SECTION IV for Optional Equipment.
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 Overtoltage Relay
1. Install overvoltage relays for each engine in accordance with instructions for single engine.
2. Install placard, Part Number 415-48655, 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. SA345S. Weight Changes: (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: Deal Alternator Installation weight – 22 lbs
ARM: Refer to Aircraft Equipment List

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

<table>
<thead>
<tr>
<th>Req. Pt</th>
<th>Engine</th>
<th>Part Number</th>
<th>Reference No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>295-20694</td>
<td>A-154</td>
<td></td>
<td>Circuit Breaker, 60 amp (KL102 or CL100)</td>
</tr>
<tr>
<td>1</td>
<td>295-20699</td>
<td>A-200</td>
<td></td>
<td>Circuit Breaker, 5 amp (MDO24510S or equivalent)</td>
</tr>
<tr>
<td>1</td>
<td>465-45023</td>
<td>A-161</td>
<td></td>
<td>Ammeter, 60 amp (SW355M)</td>
</tr>
<tr>
<td>1</td>
<td>015-01246</td>
<td>A-152-3</td>
<td></td>
<td>Fan, Cooling, for opposite rotary engine</td>
</tr>
<tr>
<td>1</td>
<td>015-01245</td>
<td>A-179-1</td>
<td></td>
<td>Arm, Belt Adjust, PA-22</td>
</tr>
</tbody>
</table>

*Reference Fan/Alternator rotation from rear of Alternator. (Fan should pump air from inside Alternator.
### Spares List

<table>
<thead>
<tr>
<th>Req. No.</th>
<th>Part Number</th>
<th>Reference No. (Old P/N)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>015-01237</td>
<td>A-152A</td>
<td>Alternator Assembly</td>
</tr>
<tr>
<td>1</td>
<td>245-2393</td>
<td>A-177-1</td>
<td>Capacitor</td>
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<tr>
<td>1</td>
<td>555-04139</td>
<td>A-152A-1</td>
<td>Resistor</td>
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<td>116-09064</td>
<td>A-152-2</td>
<td>Brush Assembly</td>
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<td>015-01347</td>
<td>A-152-4</td>
<td>Fan, Cooling Standard Rotation</td>
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<td>015-01246</td>
<td>A-152-3</td>
<td>Fan, Cooling, For opposite rotation engine</td>
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<td>015-01240</td>
<td>A-1670</td>
<td>Mount Bar Assembly w/Hardware</td>
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<td>1</td>
<td>015-01245</td>
<td>A-179-1</td>
<td>Arm, Belt Adjust, PA-22</td>
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<tr>
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<td>625-61609</td>
<td>A-153-0</td>
<td>Voltage Regulator Assembly</td>
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<tr>
<td>1</td>
<td>625-61610</td>
<td>A-153-3</td>
<td>Strap, Grounding</td>
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<tr>
<td>1</td>
<td>245-23810</td>
<td>A-178A</td>
<td>Spike Guard Assembly</td>
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<tr>
<td>1</td>
<td>245-23700</td>
<td>A-178</td>
<td>Capacitor</td>
</tr>
<tr>
<td>2</td>
<td>165-15641</td>
<td>A-178-2</td>
<td>Cam;</td>
</tr>
<tr>
<td>1</td>
<td>435-42371</td>
<td>A-178-3</td>
<td>Lead Assembly 3-5/8&quot;</td>
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<tr>
<td>1</td>
<td>435-42372</td>
<td>A-178-3</td>
<td>Lead Assembly 5-5/8&quot;</td>
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<td>395-37892</td>
<td>A-178C</td>
<td>Hardware Kit</td>
</tr>
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<td>635-62448</td>
<td>0VR-128</td>
<td>Overvoltage Relay</td>
</tr>
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<td>1</td>
<td>415-40554</td>
<td>0VR-12A-6</td>
<td>Piscoc, Single Engine</td>
</tr>
<tr>
<td>1</td>
<td>415-40555</td>
<td>0VR-12A-7</td>
<td>Piscoc, Twin Engine</td>
</tr>
</tbody>
</table>

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

### Section V

**Supplemental Information**

1. Compliance with the following excerpt from "Aviation Service News," Vol. XII, No. 2, Feb. 1960 is recommended when an 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 A-470 and A-470 series engines. The shock mounted generator bracket is available for installation on the Bonanza series of airplanes, 610-60 series C-4806 through D-4161. Installation of this new bracket will be made at the factory on all Model 33 aircraft and on Bonanzas, series C-4806 and after. This improved bracket assembly was developed by Continental Motors and is available in Continental kit EO-5941. The kit consists of four shock shock mounts, a new generator bracket, a new mounting bracket, alteration and installation instructions. Further information concerning Kit EO-5941 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 and is a kit, but individual parts are currently available from Tailever Continental Motors through their customer service department in Mobile, Alabama. (See Generator and Brackets, Models 16-470 C through D in Continental-Mooney Book.)

2. Installation of Alternators on Aircraft Equipped with Counter-Rotating Engines. An opposite rotation fan, Part Number 015-01247, is available from the factory on an exchange basis at no charge. Remove the Part Number 015-01247 fan from the alternator to be installed on the opposite rotation engine and replace with Part Number 015-01246 fan.

3. Piper PA-24-250 Belt Recommendations — Gates Belt (P/N 1570G (131), 8598 (213/18") or 8242 (52-1/8琼).)

4. 8598 is approved for installation on those aircraft listed on page 3 using the "idler deck" Lycoming engines. Later versions of some aircraft will have the "idler deck" Lycoming engine installed. Check with your local GARCO for assistance with field approval to install this alternator system on noise deck Lycoming engines. 

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5. 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 AV-11 (single engine).

1. In order to properly align the alternator belt it will be necessary to modify the existing front generator mount mounting bracket by drilling one 5/16" hole 1/1" ahead of the bolt. Cut the bracket end off and reinstall 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.

3. The generator belt tension adjustment bar is turned upward and attaches 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 FN-4663 or Good year FF-360 Belts.

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[Diagram of alternator installation with labeled parts]