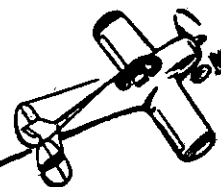


Ercoupe MEMORANDUM

ERCOUPE
SERVICE
MEMORANDUM

No. **23**

**SUBJECT: Installation of generator, starter,
voltage regulator and battery**



1. The above electrical equipment is now being received by the company and kits will be shipped to you as soon as possible. We are, therefore, supplying you with the following instructions to enable you to set up a standard procedure in making installations. The following instructions are based on actual installations.

2. Electrical system master switch must be in "off" position while installations are being made. Installations are as follows:

A. Remove engine cowling (top and sides).

1. Release Dzus fasteners on cowling, right and left sides.
2. Unscrew six screws holding cowling top.
3. Lift off engine cowling in one piece.

B. Generator Installation.

1. Remove tape from loose wire cluster suspended between left magneto and firewall (taped to engine support).
2. Remove tape from cable ends.
3. Remove generator cover plate from engine; located on back center of engine, below magnetos. Take care not to damage gasket. Do not remove gasket.
4. Remove safety wire on carburetor mixture control arm, to allow cable to slip back so that cable clip may be removed from cover plate stud.
5. Install generator.
 - a. Install generator on engine. Be sure that gear teeth are meshed.
 - b. Draw mounting nuts right, remount mixture control cable clip, lock with palnuts. Connect and safety mixture control.
 - c. Connect generator cables.
 - (1) Wire no. 7 to terminal marked "A".
 - (2) Wire no. 9 to terminal marked "B".

- d. Draw terminal nuts tight to assure lock.
- e. Tape terminal connections and shellac.
- f. Remove shipping tape covering from generator breather tube.

C. Starter Installation.—Starter cover plate is located on back center of engine above magnetos. Installation is as follows:

1. Remove cover plate (Do not damage or remove gasket).
2. Remove and discard two aircraft bolts, at top of starter mount, and replace with coarse thread drilled head bolts (AN75A-33) supplied with starter. The engine cooling baffles may be deflected to provide access for placing the starter in position.
3. Install starter.
 - a. Mount starter in place. Be sure gear teeth are meshed.
 - b. Tighten mounting bolts and plain nuts on studs.
 - c. Return engine cooling baffle and magneto harness, anchor clips, to their original positions.
 - d. Lock mounting nuts with palnuts.
 - e. Safety bolts, on top of starter mount, with safety wire across heads.
 - f. Connect wires nos. 1 and 4 to single terminal on starter button.
 - g. Tape terminals and shellac.
 - h. Connect starter control cable to control arm on starter. Adjust the connector on end of control cable to provide 1/16" clearance between the control arm and the starter clutch with the starter knob pushed against instrument panel. The starter clutch has an engaging motion of 9/16". At the end of this motion the starter makes electrical contact.

D. Voltage Regulator Installation.—The voltage regulator is mounted on a center section frame, behind right seat immediately below the luggage compartment bag. Installation is as follows:

1. Open zipper in bottom of luggage compartment bag.
2. Remove tape from loose cables located beside battery box.
3. Install voltage regulator using three AN4-5a bolts (Frame brace just forward of battery box is drilled with three holes for mounting voltage regulator).
4. Connect cables to terminals on voltage regulator as follows:
 - a. Cable no. 6 to terminal marked "BATT."
 - b. Cable no. 7 to terminal marked "GEN."
 - c. Cable no. 8 to terminal marked "FIELD"
5. Tighten terminal nuts to assure lock.
6. Install battery prior to closing baggage compartment.

E. Battery Installation.—The battery installation should be made with certain definite precautions so as to eliminate fire hazards. Oil film on adjacent structures should be wiped away. Oily rags must not be used during battery installation. Installation is as follows:

1. Unscrew wing nuts, remove battery box cover and check box drains.
2. Install battery in box with terminals toward fuselage wall and positive terminal forward. (Use utmost caution when lowering battery into box, so as not to short terminals and cause sparks.) Be sure that battery case seats properly and that the terminals do not ground the box.
3. Pass cables through rubber grommets and connect as follows:
 - a. Cable no. 4 to positive (+) post of battery.
 - b. Cable no. 3 to negative (—) post of battery.
4. Replace battery box cover with care, so as not to short terminals or damage rubber grommets.
5. Tighten wing nuts of battery box cover.
6. Close Baggage Compartment.

3. After the above installation has been made, the engine should be run to check the installation for satisfactory operation. The following will provide information for the check:

- A. The generator (Delco-Remy No. 1101876) driven at a speed ratio of 2.1:1 will cut-in at an engine speed of 1150 to 1250 rpm. The maximum output of thirteen amperes per hour

is reached at an engine speed of 1600-1700. The generator is a two brush shunt type with a Voltage Regulator controlling the field winding. In some instances the new generators may require that the field magnetos be polarized to obtain operation. This is accomplished by flashing or momentarily connecting the battery and generator terminals on the voltage regulator with battery installed and master switch in the "on" position.

- B. The voltage regulator (Delco-Remy No. 1118259) consists of three units, a cut-out relay, a current regulator and a voltage regulator mounted on the same base with a single cover. The cut-out relay closes at 12.4 to 13.4 volts. The current regulator limits output to 12 amperes per hour plus or minus one ampere. The voltage regulator limits voltage to 14.0 to 14.2 volts. This information shall not be considered by inference or otherwise that an attempt should be undertaken to adjust the unit. It is stated to show that the current output will vary during operation. To that end, a normal operation would indicate a charging rate up to 11-13 amperes for periods of time up to twenty minutes after starting. The charging rate should reduce to two amperes or less in a shorter period of time than two hours of operation. Lesser rates would indicate a favorable condition of the battery. When the charging rates exceed those stated, the system should be checked to determine the trouble. That check must be referred to a specialist.

C. In any event, the Voltage Regulator must not be altered by anyone aside from factory personnel. Such alterations will void the warranty on this item over the generator and battery.

4. Certain operating instructions and information must be called to the attention of owners to obtain satisfactory operation.

- A. The variable current output, as indicated in part B of the preceding paragraph, should be understood and periodically checked by the pilot during flight operation.
- B. Battery maintenance shall include checking electrolyte level every twenty-five hours of flying time or thirty days, whichever occurs first. Extreme care should be exercised in adding water to prevent the level rising above the opening in the non-spill vent. The operation should be referred to persons familiar with aircraft batteries.
- C. To prevent undue generator brush wear, the system should not be operated with the master switch in the off position, battery disconnected or the fuse burned out. In the latter item, the fuse located on the right hand side of this instrument panel protects only the generator output circuit and does not give protection to the light circuits which are protected by circuit breaker incorporated in the navigation light switch.

5. The electrical installation, when completed, will require that the Weight and Balance Form and the C.A.A. Form 309 be corrected. The Weight and Balance Form can be revised by striking out the affected notations and inserting corrected notations under the guidance of a C.A.A. Inspector or an authorized Designee. They will then issue a revised Form 309.

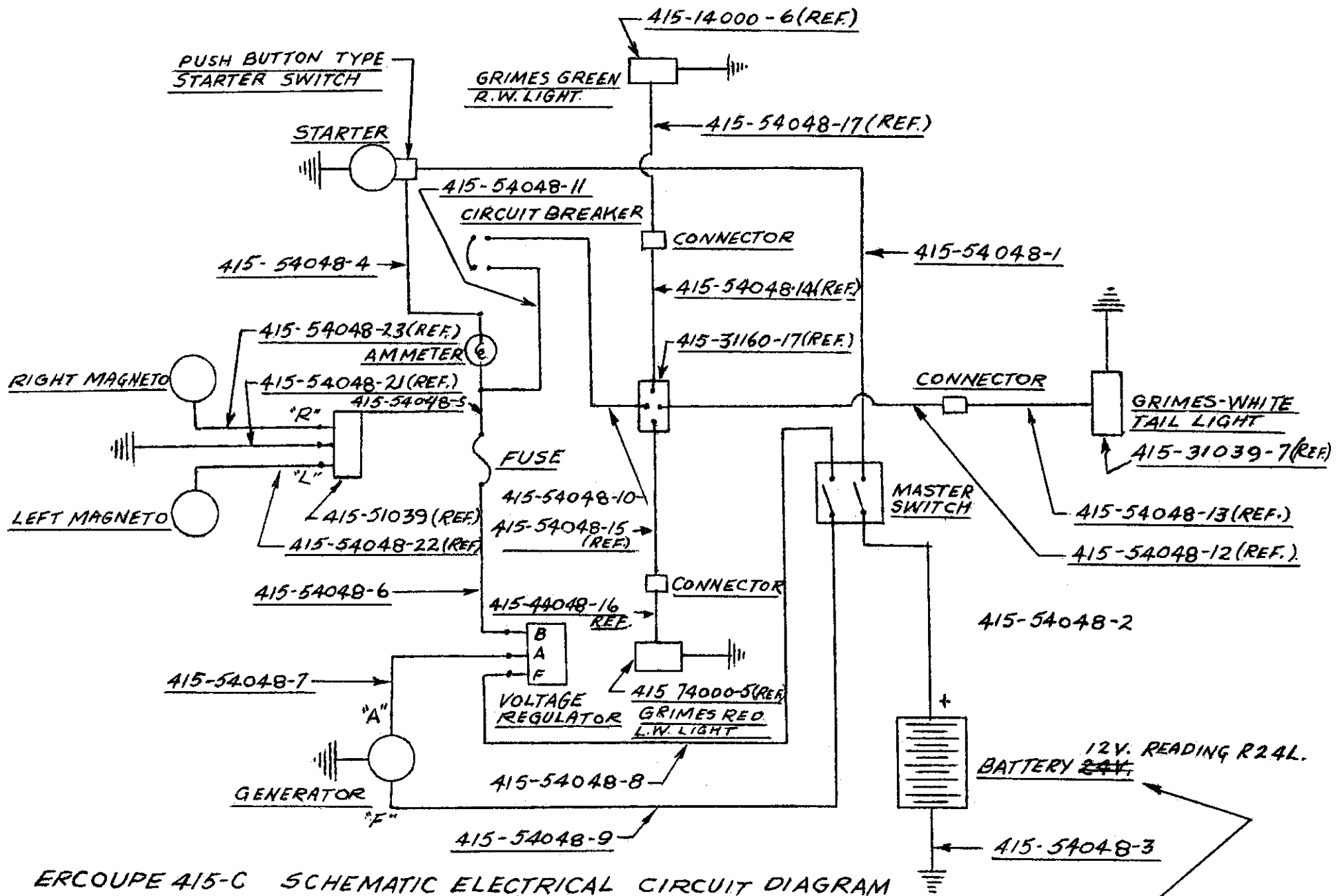
6. A copy of the currently used Weight and Balance Form is a part of this Memorandum. Tabulated weights and arms for the various items on the airplane are shown on the reverse side of the form. This information is to provide data for correcting the Weight and Balance form.

7. The Weight and Balance Form is revised by correcting the weight empty, horizontal moment and arm. In the case of the electrical system the weight

is increased by 49 pounds and the horizontal moment is increased by 1222 inch pounds. The arm is the dividend product of the revised weight and moment. These corrections provide the necessary data for completing the form except that the allowable baggage must be determined so as not to exceed the allowable gross weight of 1260 pounds or exceed the approved rearward c. g. limits.

8. Additional copies of the attached Weight and Balance Form will be forwarded to Ercoupe Distributors.

9. Your cooperation in disseminating this information to Ercoupe owners immediately is requested. It is further requested that you arrange to effect these installations on all effective Ercoupes within your territory as early as possible.



ERCOPE 415-C SCHEMATIC ELECTRICAL CIRCUIT DIAGRAM

ERCOPE SERVICE DEPT. MEMORANDUM No. 23 CORRECTED 6-10-46

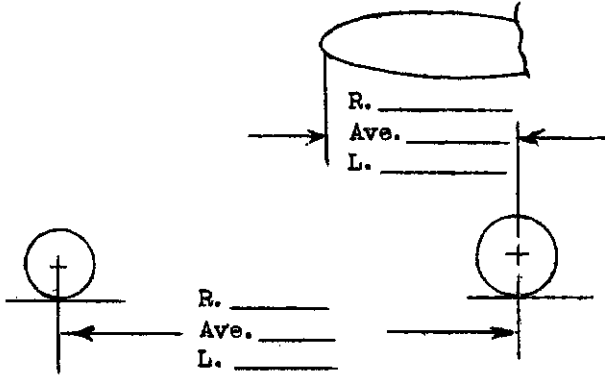
ENGINEERING AND RESEARCH CORPORATION

WEIGHT AND BALANCE
 Manufactured under Production Certificate #17

ERCOUPE MODEL 415-C DATE OF MANUFACTURE _____

N C. _____ ENGINE NO. _____

SERIAL NO. _____



Position	NET	
	ACTUAL	COMPUTED
Rear R.		
Rear L.		
Nose		
TOTAL		

Useful Load _____ #
 Empty Weight Horizontal C. G. _____ Aft L. E. W.
 _____ Aft Datum

Datum is Firewall
 L. E. W. is 15.75 aft datum

Extreme C. G. Positions						
Forward C. G.				Rearward C. G.		
	WEIGHT	ARM	HORIZONTAL MOMENT	WEIGHT	ARM	HORIZONTAL MOMENT
Empty Weight Actual						
-Computed-						
Pilot	170	37	6290	170	37	6290
Gasoline - Fuselage Tank	30	7	210	30	7	210
Gasoline - Wing Tank R.	54	25	1350	42	25	1050
Gasoline - Wing Tank L.	54	25	1350		25	
Oil	8	-14	-112	8	-14	-112
Passenger		37		170	37	6290
Baggage		57			57	
TOTAL						
H. C. G. inches aft ref.						
H. C. G. %MAC						

L. E. M. A. C. is 18.6 aft of datum
 M. A. C. is 57.1 inches

Approved C. G. Limits F'w'd. 28.4" aft ref.
 R'w'd. 30.3" aft ref.

BAGGAGE ALLOWANCE	
1. Pilot and no passenger.....	65
2. Pilot and passenger (max. fuel).....	
3. Pilot and passenger (min. fuel).....	
4. Max. Baggage Never to Exceed.....	65
5. Minimum Fuel.....	12 gal

Approved by _____ Weight and Balance Engineer

Verified by _____ Inspector for the Authority