

2750

## *Assembly Instructions*

### *General*

Rights and lefts are determined while standing at the tail and looking toward the nose of the airplane.

Bolts and clevis pins should be installed with heads up, forward or outboard. Make it a practice to tighten the nut and insert the cotter key on each bolt as used, never leaving any finishing process to be done at a later date. This will avoid the possibility of leaving out the very important cotter keys.

### *Center Section*

First, prepare the center section for installation by attaching the center section strut to the center section before installing it

## Center Section (Cont'd)

on the fuselage. The right hand strut can be distinguished as it has clips on both front and rear members for holding the gasoline lines, while the left hand strut has clips on the rear member only. The bolts,  $\frac{1}{4}$ " x  $1\frac{1}{4}$ ", should be inserted with the nuts toward the center of the airplane and locked with cotter keys. (See Illustration No. 1.)

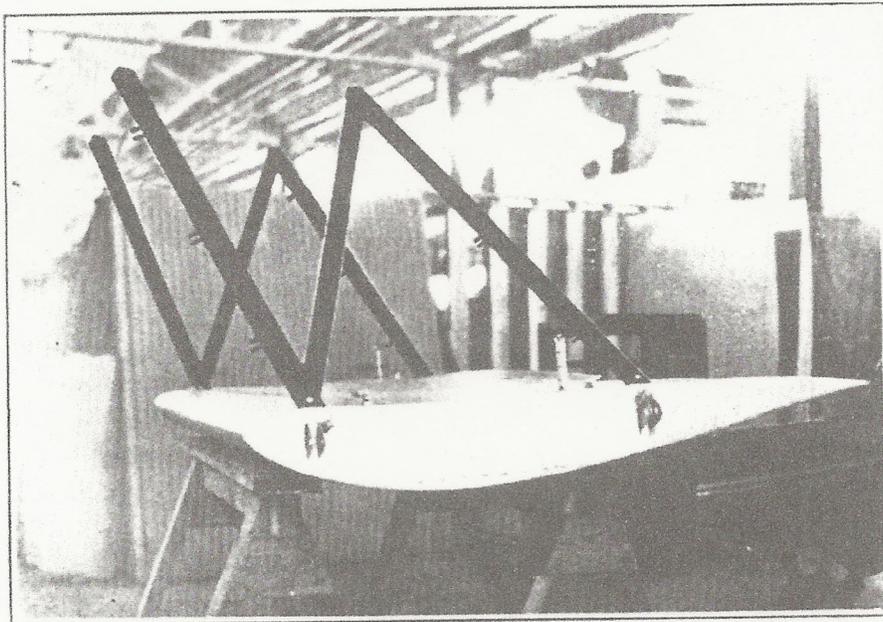


ILLUSTRATION No. 1

Now with one man on either side of the center section, place this on the fuselage and attach the struts at the rear fitting on the fuselage first. After the rear fitting bolts are in place, the strut can be attached to the front fuselage fitting. The bolts which secure the center section strut to the fuselage are size  $\frac{5}{16}$ " x  $\frac{7}{8}$ ". The center section cross wires are  $\frac{5}{16}$ " streamline with one end left round for about half its length. Insert the round end of the wire down through the rubber grommet in the top of the cowling. Start the other end of the wire in the fitting, projecting from the under side of the center section. When threads are just started put the terminal on the lower end of the wire and give it the same number of turns that the upper end had in the center section, about two or three are sufficient. While holding the terminal at the lower end from turning, with a screw driver tighten the wire until the terminal can be slipped over its fitting inside the cowling and secured with a  $\frac{3}{8}$ " clevis pin. The head of this pin should be toward the front.

## *Center Section---(Cont'd)*

Draw these wires up quite snugly, being careful that they are exactly the same length. They can be measured by inserting a steel tape through the rubber grommet beside the wire or by the use of a trammel. The gasoline lines can now be fastened to the struts by the above mentioned clips and attached to the tanks by the fittings provided there.

It is important that the tubing be held firmly well up in the fitting while the fitting nut is tightened.

## Wing Rigging

Thread the navigation light wires from the upper wings down through the diagonal (center) interplane struts and bolt the struts to rear fitting on upper wing using  $\frac{1}{4}$ " x  $1\frac{1}{2}$ " bolts. Also attach the front interplane struts to the front fittings on the upper wings. The lower ends of the front struts have adjustment screws. Bolt these lower ends to the diagonal struts using  $\frac{1}{4}$ " x  $\frac{3}{4}$ " bolts.

The wing wires consist of four  $\frac{1}{4}$ " streamline and six  $\frac{5}{16}$ " streamline wires. The  $\frac{1}{4}$ " wires are the landing wires, the longer pair of these being the front landing wires. The longest pair of  $\frac{5}{16}$ " wires are the front flying wires. The other four  $\frac{5}{16}$ " wires constituting double rear flying wire are of equal length.

With one man in the rear cockpit and at least two men handling the lower wing, attach each lower wing to the fuselage using  $\frac{3}{8}$ " x  $2\frac{1}{8}$ " bolts. Bolt the front spar fitting to the fuselage fitting placing this bolt with head to the rear; then using a  $\frac{3}{8}$ " x  $1\frac{1}{2}$ " bolt secure the rear spar fitting to the fuselage placing this bolt head front.

Attach the rear landing wire to support the wings temporarily until ready to attach the upper wings. Note all streamline wires have the right hand thread at the bottom. It will be necessary to disconnect this landing wire while putting the upper wing in position.

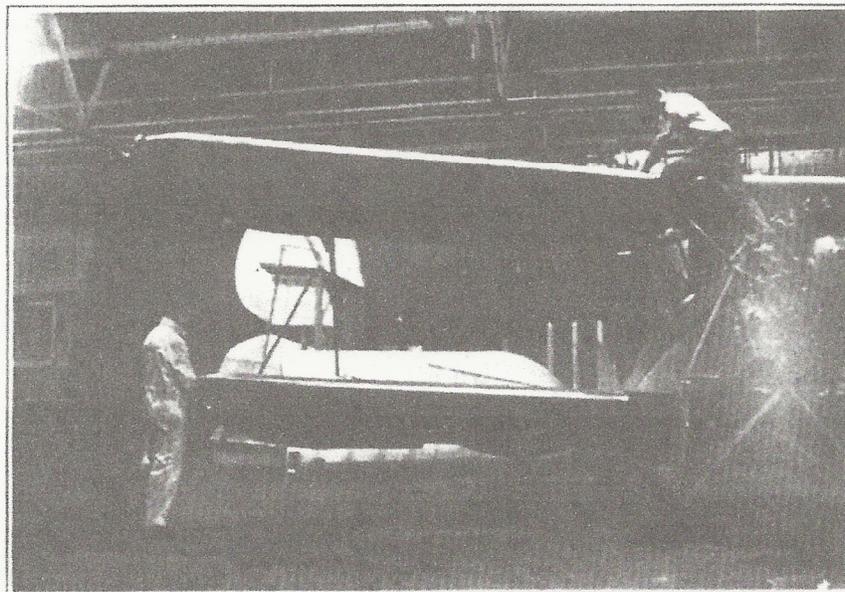


ILLUSTRATION No. 6

## Wing Rigging (Cont'd)

After both lower wings are in place, the upper wings should be installed in the following manner:

(Note Illustration No. 6) After protecting the rear cockpit cowl have a man stand on this cowl and guide the upper wing into position. This man should have four  $5/16''$  x  $1\frac{3}{4}''$  bolts threaded for  $\frac{3}{4}''$  together with four pair of taper bushings, one pair to go on each bolt. At least two men will be required to place this upper wing in position and a fourth man will be required to support the lower wing while the upper is being secured.

Loosen the landing wire supporting the lower wing temporarily and place the upper wing in position, being careful to see that landing wire terminals from the center section go down through the patches provided in the upper wing for these terminals. The man on the center section will then bolt the upper wing securely to the center section using bolts and bushings above described. The diagonal wing strut can then be attached to the lower wing and the rear landing wire again screwed in place. The wings on this side will now be self-supporting and the upper wing can be placed on the other side in the same manner.

The front landing wires should be tightened until they measure  $94\frac{1}{8}''$  between the exposed ends of the terminals. Adjust the rear landing wires and variable front wing struts until the wings are rigged flat. In other words so that the lower surface of the wings appears entirely flat, not warped up or down viewed from wing ends. This can best be observed on the lower wings by standing ahead of the wings in a position where you can sight the lower surface of the wings, on the upper wings by standing behind the wings and sighting the lower surface. In other words the airplane is rigged flat; it is not necessary to make any allowance for propeller torque.

Attach and tighten flying wires to hold wings in this position and then attach rear wing struts properly adjusted to maintain this position. If the rear landing and flying wires touch each other, they should be padded to prevent wear. Tighten all wires to a fair tension, making sure they are left in a streamline position and attach wing pencils with friction tape.

With the control stick in neutral position adjust aileron control rods so that ailerons will be flush with the lower wings and connect these control rods to the aileron control horn, using  $\frac{1}{4}''$  x  $1''$  bolt. Attach the aileron struts with the adjustment end down using  $\frac{1}{4}''$  x  $\frac{7}{8}''$  bolts and adjusting them so that the trailing edge of the upper aileron will be parallel to the trailing edge of the upper wing.

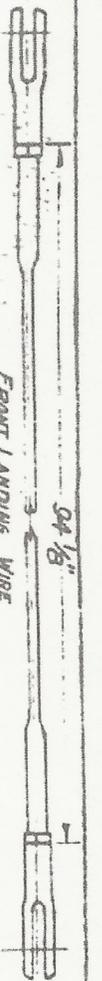


FIG. 4

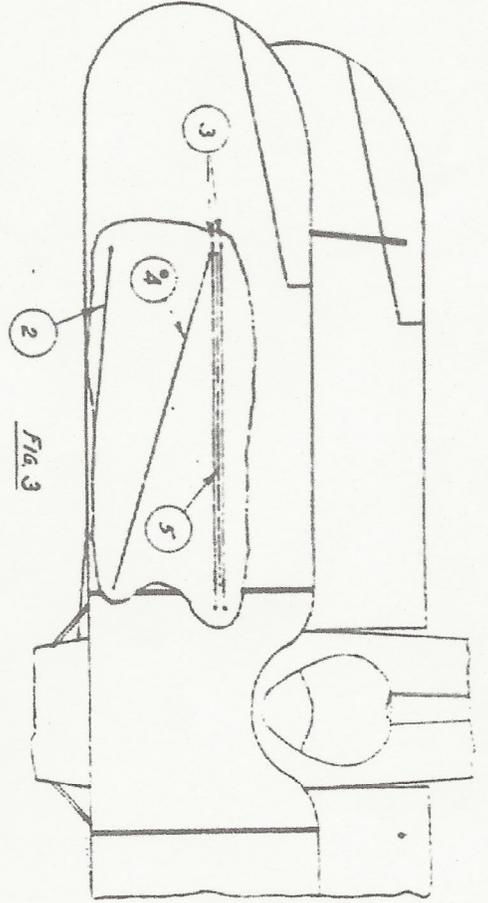


FIG. 3

- 1-CENTER SECTION WIRE 5
- 2-FRONT LIVING WIRES  $\frac{3}{8}$  X 103 1/4 ACTUAL WIRE LENGTH
- 3-REAR LIVING WIRES  $\frac{3}{8}$  X 100 1/4 ACTUAL WIRE LENGTH
- 4-FRONT LANDING WIRES  $\frac{1}{2}$  X 96 ACTUAL WIRE LENGTH
- 5-REAR LANDING WIRES  $\frac{1}{2}$  X 91 1/2 ACTUAL WIRE LENGTH
- 6-ADJUSTMENT FOR SHORT STRUT
- 7-ADJUSTMENT FOR LONG STRUT
- 8-ADJUSTMENT FOR AILERON STRUT

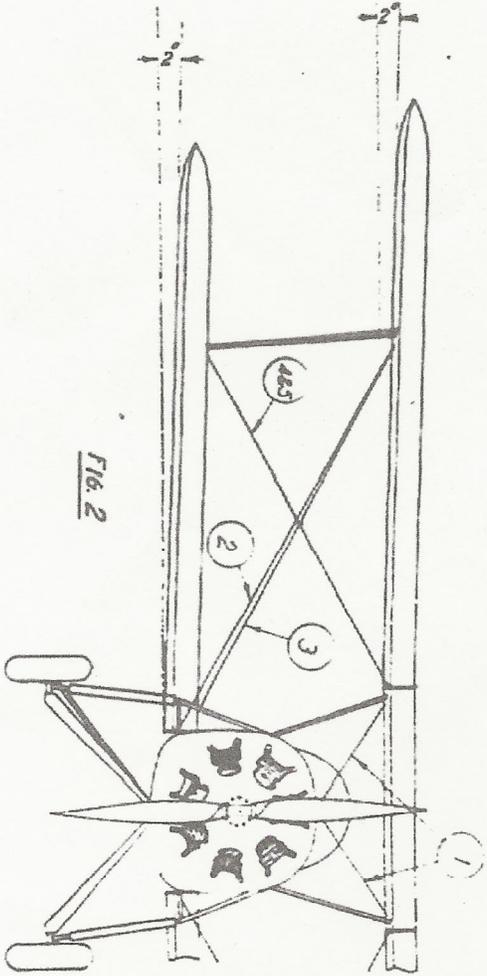


FIG. 2

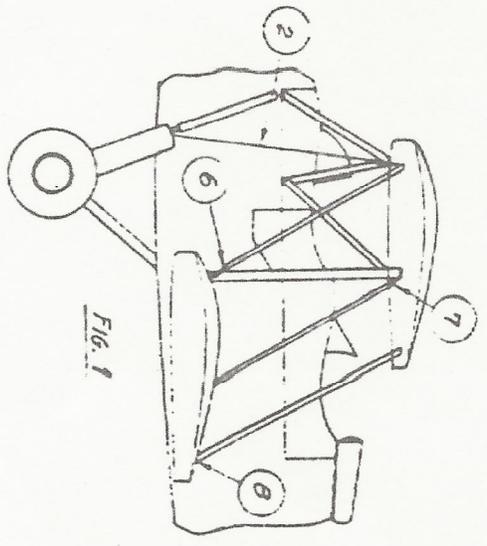


FIG. 1

## Tail Assembly

Before shipment the empennage is fitted on each airplane and is left as near assembled as is practical in shipment. You will, therefore, experience no difficulty in the reassembly.

Stabilizer and elevators will be shipped assembled and the first operation is to get the stabilizer right side up, which will place the ball nut on top. First, screw this ball nut on the threaded bolt which will be done by having one man in the cockpit work the stabilizer cord which will turn this bolt and let another man hold the stabilizer properly aligned so the threads will start. When the nut has been screwed down to a neutral position, replace the square guide sleeve on the upper end of the stabilizer adjuster screw and lock in place with a washer and cotter key. Attach the rear of the stabilizer to the fuselage with a  $\frac{1}{4}$  x  $1\frac{1}{8}$ " bolt.

The elevator control wires pass through pulleys just ahead of the stabilizer. The wire on the upper pulley should be attached to the upper end of the elevator horn. Adjust the elevator cables and the position of the elevators by means of turnbuckles just aft of the pilot's seat which may be reached through zippers in the bottom of the fuselage, being careful that not over two threads show from either end of the turnbuckle barrel after adjusting. When properly adjusted the leading edge of the elevator at the extreme point of the balance should have a down travel below the stabilizer when in full down position of approximately  $10\frac{1}{4}$ ". (Note Illustration No. 5 for this measurement.)

Hold fin approximately in position and attach navigation light wires taping them to one side so they will not conflict with any moving parts.

Install the fin by inserting the fin into the tail post bolting it in place with a bolt just above the lower rudder hinge. The bolt is size  $\frac{1}{4}$ " x  $\frac{1}{2}$ ". Fasten the front of the fin to the bracket which supports the stabilizer adjuster screw with a bolt  $\frac{1}{4}$ " x  $\frac{5}{8}$ ".

Inspect carefully all nuts and cotter keys and then install tail cowl. First, screw front section of tail cowl in place, then hold the two sides which go at the rear of the tail cowl in place and hook the spring at the center. This will hold the two sides roughly in position while the wood screws are inserted along the bottom, one small machine screw inserted at each side in front fastening the upper part of the side cowl to the front cowl and  $\frac{1}{4}$ " x  $1\frac{5}{8}$ " bolt inserted to hold the two sides together at the rear.

## Tail Assembly (Cont'd)

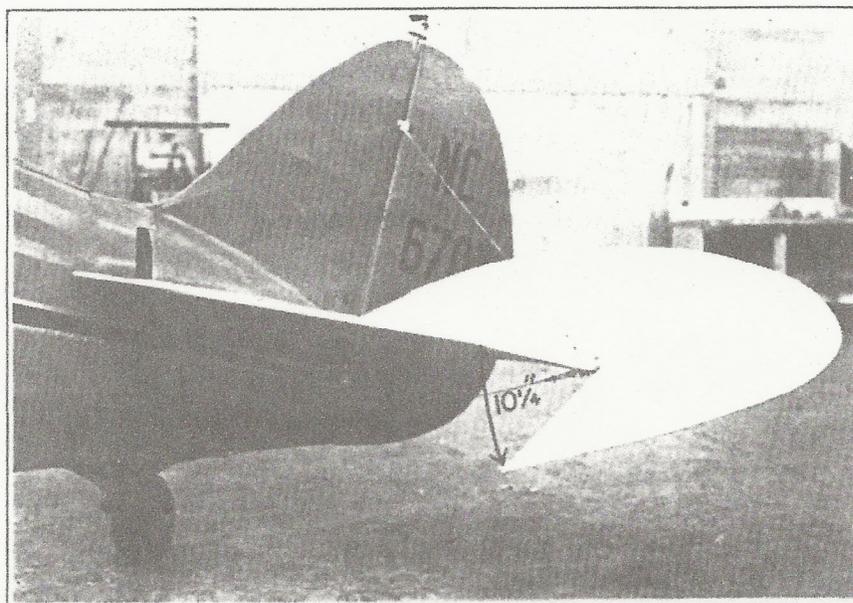


ILLUSTRATION No. 5

Attach the top and bottom tail wires to the stabilizer using  $\frac{1}{4}$ " x  $1\frac{3}{4}$ " bolts. The bottom wire is the shorter one. The clip on the stabilizer end of the top tail wire is more nearly straight than that on the upper end. This top tail wire bolt also holds the upper rudder hinge. Attach the rudder being sure to fasten the tail wires and rudder hinge with this bolt. Then attach lower rudder hinge with bolt which is  $1\frac{1}{4}$ " x  $\frac{3}{4}$ ". The upper rudder hinge bolt is  $1\frac{1}{4}$ " x  $1\frac{7}{8}$ ". Tighten the tail wires being careful that stabilizer is kept straight. When properly adjusted both bottom wires will be the same length and both top wires the same length. Check by eye to see that the fin post is perpendicular to the center section and the stabilizer is parallel to the center section.

Bolt the rudder wires to the rudder horn and adjust turnbuckles until rudder action from stop to stop gives comfortable pedal action.