ROYAL AIR FORCE.

TECHNICAL NOTES

R.E.7.

NOTE.

THE information contained herein is not to be communicated either directly or indirectly to any person not holding an official position in His Majesty's Forces.

13

T.5

R.E.7.

(150 H.P. R.A.F.4A.)

(160 H.P. BEARDMORE.)

(250 H.P. ROLLS-ROYCE.)

RIGGING NOTES.

Ap.D. (P.). 3/18.

R.E.7.

(150 H.P. R.A.F.4A.)

(160 H.P. BEARDMORE.)

(250 H.P. ROLLS-ROYCE.)

MANUFACTURERS' ORDER OF ERECTION.

1. Fuselage assembled and trued up.
2. Undercarriage fitted to Fuselage.
3. Controls fitted in front of Fuselage.
4. Tail Skid fitted.
5. Main Petrol and Oil Tanks fitted.
6. Engine mounted.
7. Engine Controls fitted.
8. Instrument Board fitted.
9. Front Cowling fitted.
10. Centre Section fitted and trued up with Machine in Rigging Position.
11. Empennage fitted.
12. Fairing fitted.
13. Elevator and Rudder Controls fitted and adjusted.
14. Fuselage covered and doped.
15. Main Planes attached and trued up.
16. Controls connected and adjusted.

R.E.7.

(150 H.P. R.A.F.4A.)

(160 H.P. BEARDMORE.)

(250 H.P. ROLLS-ROYCE.)

TRUING UP THE FUSELAGE.

The Side Struts are numbered from front to rear.

With Fuselage true and in Rigging Position, the Top Longerons are horizontal from Side Struts No. 1 to Side Struts No. 5.

Place the Fuselage on two trestles, one being placed under Side Struts No. 2 and the other under Side Struts No. 10.

Trammel and adjust the Internal Cross Bracing Wires in the transverse sections through Side Struts Nos. 1 and 10 until the diagonals are respectively equal.

Mark points $12\frac{5}{16}$" below the upper surface of the Top Longerons on all Side Struts from Nos. 1 to 5 inclusive, and mark the mid points of all Side Struts to the rear of Side Struts No. 5.

Lightly clamp straightedges transversely across Side Struts Nos. 1 and 10, so that the marked points coincide with the upper edge of the straightedge in each case.

Stretch two lines *outside* the Fuselage, one on each side, from the upper edge of the front straightedge to the upper edge of the rear straightedge.

Stretch a line from the mid point of the front straightedge to the axis of the Sternpost. This line will be inside the Fuselage.

Mark the mid points of all Top and Bottom Struts.

Working from front to rear, adjust the Internal Cross Bracing Wires until corresponding diagonals are equal at each Transverse Section. (Transverse Sections 1 and 10 were trued up before the straightedges were attached.) Check by trammel.

R.E.7—Continued.

Adjust the Top and Bottom Cross Bracing Wires until all the mid points on the Top and Bottom Transverse Struts and the *internal* stretched line are in the same vertical plane. Check by dropping a plumb line from the mid point of each of the Top Transverse Struts. This plumb line should just touch the *internal* stretched line, and also the mid point of the Bottom Transverse Strut in the same Transverse Sections.

Adjust the Side Cross Bracing Wires on both sides until the marked points on all Side Struts are in line with the two outer stretched lines, and all Side Struts are vertical. Check the marked points by sighting them in between the *outer* stretched lines.

TRUING UP THE UNDERCARRIAGE.

The Undercarriage should be symmetrical about the vertical centre line of the Machine when viewed from the front. Adjust the Undercarriage Cross Bracing Wires until corresponding diagonals are equal. Check by dropping plumb lines from the mid points of the Bottom Transverse Struts which are above the Undercarriage. These plumb lines should bisect the Centre Longitudinal Tube of the Undercarriage Frame.

The axle should be at right angles to the longitudinal axis of the Fuselage. Check by taking measurements from the Rudderpost to the Axle End Collar of the Undercarriage Wheels. Corresponding measurements should be the same on both sides.

The centre line of the Axle should be $7\frac{1}{2}$" in front of the axis of the first Transverse Steel Tube at the bottom of the Fuselage. Check by dropping a plumb line from the first Transverse Steel Tube. The fore and aft distance of the centre line of the Axle from the plumb line should be $7\frac{1}{2}$".

PLACING THE MACHINE IN FLYING POSITION.

Before truing up the Centre Section and attaching the Main Planes it is necessary to get the Machine in Flying Position.

To do this, block up the Machine under the Undercarriage Struts and support the Tail on a trestle placed near the Sternpost.

The Machine is in Flying Position when the Top Longerons between Side Struts Nos. 1 and 5 are level transversely and longitudinally.

Level transversely by spirit level and straightedge placed across the Top Longerons, and make any adjustments by packing blocks under the Undercarriage Struts.

Level longitudinally by spirit level placed on the Top Longerons, and make any adjustments by raising or lowering the Tail.

R.E.7—Continued.

TRUING UP THE CENTRE SECTION.

In this Machine there is no Centre Section Upper Plane. The Centre Section consists of a Rib, inclined at the angle of Incidence, to which the Port and Starboard Upper Main Planes are attached.

This Centre Rib is supported by Pylons, the lower extremities of which are attached to the Top Longerons at Side Struts Nos. 1 and 3. The Pylons should be symmetrical about the vertical centre line of the Machine when viewed from the Front.

The Incidence and Stagger of the Centre Rib is adjusted by means of the four Drift and Anti-Drift Cables attached to the apices of the Pylons.

ATTACHING THE MAIN PLANES.

The Main Planes are assembled with their Leading Edges on the ground. All Interplane Struts are fitted and the Incidence and Outer Flying and Landing Wires are loosely connected.

The Planes are then lifted into position, and the ends of the Spars of the Lower Main Planes are inserted in the Front and Rear Spar Brackets. The ends of the Spars of the Upper Main Planes are inserted in the Front and Rear Spar Attachments on the Centre Section Rib.

The Inner Landing and Flying Wires are now loosely connected.

TRUING UP MAIN PLANES.

Adjust the Front Landing Wires until the distances XX and YY are respectively equal on the Port and Starboard sides. The distance XX is the distance between a point on the apex of the Front Pylon and the Bottom Socket of the Front Outer Strut. The distance YY is the distance between a point on the Front Spar at the Root of the Lower Main Plane and the Top Socket of the Front Outer Interplane Strut.

The Leading Edges of both Upper and Lower Main Planes should be symmetrical in plan about the longitudinal centre line of Machine. Check by taking measurements from Bottom Sockets of Front Outer Struts to Rudderpost and Drag Wiring Plates. Corresponding measurements should be the same on both sides.

The *Dihedral* is 2½° for both Upper and Lower Main Planes. Adjust by Front Landing Wires and check by Field Clinometer or Abney level and straightedge, placing the latter along the Front Spars. A taut cord stretched across the Upper Main Planes between points over the Front Outer Struts should be 7″ above the Front Spar of the Centre Section. Check by taking measurements at the lateral extremities of the Centre Section Upper Main Plane.

The *Stagger* of the Main Planes is 2.9″ throughout. Adjust by Incidence Wires and check by dropping plumb lines from the Leading Edges of the Upper Main Planes, one plumb line being

R.E.7—Continued.

in front of each strut. The horizontal fore and aft distance between these plumb lines and the leading edges of the Lower Main Planes should be 2.9″.

NOTE.—With the 250 H.P. Rolls-Royce the Stagger is 11″.

The *Incidence* of the Port Main Planes is 4° throughout. The Incidence of the Starboard Main Planes is 4° at the *Root* and 3½° at the *Outer Struts*, to allow for Propeller Torque. Adjust by Incidence Wires, Rear Landing and Flying Wires, and check by Field Clinometer or Abney level and straightedge, placing the latter along the chord of a Rib, (1) at the Rib nearest the Root of the Plane and (2) at the Rib to which the Outer Struts are attached.

NOTE.—With the 250 H.P. Rolls-Royce the Incidence is 30.6″, with ½° Wash-out in Starboard Main Planes.

After the Main Planes have been trued up, the Auxiliary Flying Wires should be adjusted. Great care must be taken not to adjust these wires so tight as to cause initial stresses in the Upper Main Plane Spars.

FIXING THE EMPENNAGE.

Fit and bolt the Fin in position. It should point directly fore and aft and be square with the Machine.

The Tail Plane is supported on each side by two steel Bracing Tubes, which pass from the Fin to the Front and Rear Spars, and also by a Bracing Wire which passes from the Fin to the Front Spar. True up until the Tail Plane is level transversely and is square with Machine. Check for transverse level by spirit level placed along the Spars, and check for symmetry by taking measurements from the Bottom Sockets of Rear Outer Struts to the lateral extremities of the Tail Plane Rear Spar. Corresponding measurements should be the same on both sides.

The Angle of Incidence of the centre line of the Tail Plane is 4°.

Hinge the Rudder to the Rudderpost, inserting the Hinge Pins and Split Pins. The Rudder should be vertical. Check by plumb line.

Hinge the Elevators to the Tail Plane, inserting the Split Pins, and connect up all Control Wires.

CONTROLS.

Adjust the Controls so that:—

(*a*) With Pilot's Control Stick in vertical position, the Ailerons should droop 1″.

(*b*) With Pilot's Control Stick in vertical position, the Elevators should be in continuation with the Tail Plane.

(*c*) With the Rudder Bar square in the Fuselage, the Rudder and Tail Skid should point directly fore and aft and be square with the Machine.

R.E.7.
(150 H.P. R.A.F.4A.)
(160 H.P. BEARDMORE.)
(250 H.P. ROLLS-ROYCE.)

POINTS TO OBSERVE WHEN OVERHAULING MACHINE.

See that the Main Planes are symmetrical about the centre line of Machine.

See that all Lock Nuts for Bracing Wires are tight.

Examine the Bracing Wires for length and tautness in the centre section, and see that all Split Pins are in position.

Check the Dihedral.

Check the Incidence.

See that the Interplane Struts are straight, undamaged and streamlined in the direction of flight.

Examine all Main Plane Bracing Wires for length and tautness, and see that all Split Pins are in position.

Examine all Controls, Pulleys and Cables and see that they work freely, and that all Turnbuckles on Cables are locked.

Examine the Tail Plane and see that it is set correctly and is square with Machine, and that all Tail Plane Bracing Wires are correct both as to length and tautness, and that all Split Pins are in position.

Examine Rudder and Fin and see that these are set straight and square with Machine.

Measure the droop of the Ailerons.

Examine Undercarriage and Tail Skid.

Examine Tank Mountings and Connections.

Examine Engine Mounting, Engine Controls, and Engine Accessories.

NOTE.—After a machine has been erected or overhauled and found to be trued up correctly, it is advisable to measure the Pin Centre Lengths of all Landing Wires. These lengths can then be used in any subsequent erection, and the Machine quickly trued up to the required conditions.

R.E.7.
(150 H.P. R.A.F.4A.)
(160 H.P. BEARDMORE.)
(250 H.P. ROLLS-ROYCE.)

LIST OF PRINCIPAL DIMENSIONS.

Span of Upper Main Planes	57′ 0″
Span of Lower Main Planes	42′ 0″
Chord of Upper Main Planes	6′ 0″
Chord of Lower Main Planes	6′ 0″
Incidence of Port Main Planes	4° throughout.
Incidence of Starboard Main Planes	4° at Root. 3½° at Outer Struts.
Stagger (with 150 H.P. R.A.F.4a and 160 H.P. Beardmore)	2.9″
Stagger (with 250 H.P. Rolls-Royce) (With 250 H.P. Rolls-Royce the Incidence is 3° 6′, with ½° Wash-out in Starboard Main Planes.)	11″
Dihedral—Upper Main Planes	2½°
Dihedral—Lower Main Planes	2½°
Overall Length	31′ 10½″
Height	12′ 7″
Incidence of Tail Plane (Centre Line)	4°
Droop of Ailerons (with Pilot's Control Stick in vertical position)	1″
Droop of Elevators (with Pilot's Control Stick in vertical position)	Nil.