

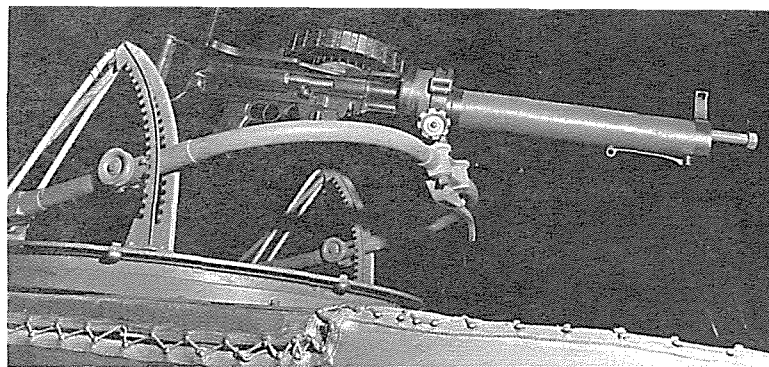
THE BRISTOL FIGHTER

of Old Warden



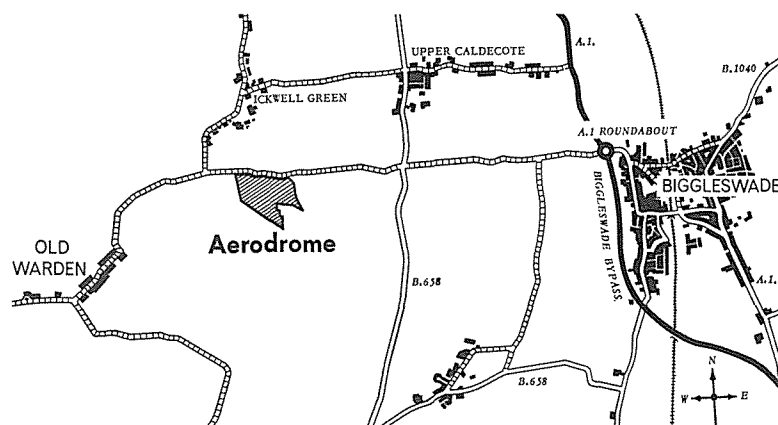
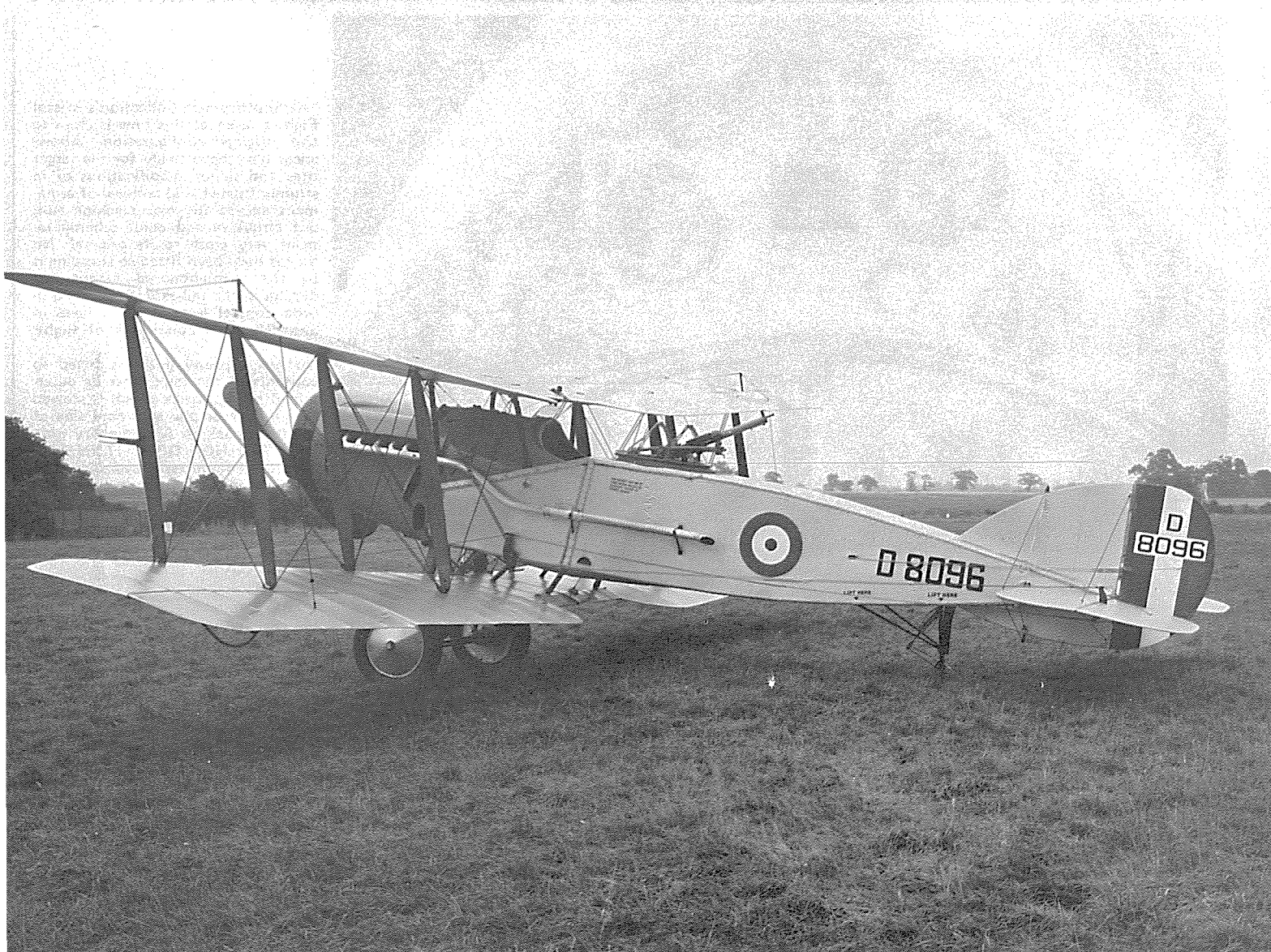
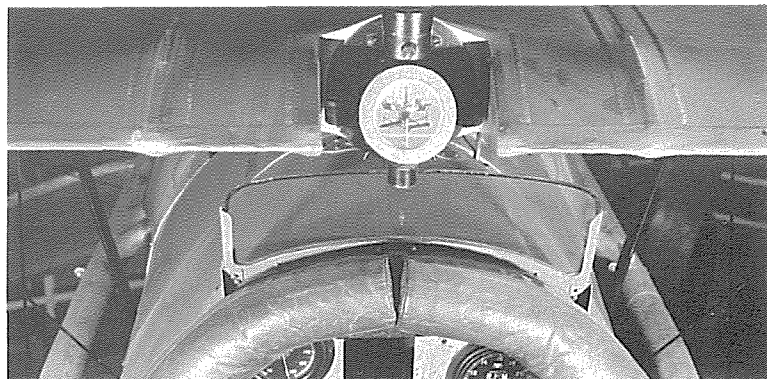
By W/Cdr. T. E. GUTTERY, R.A.F. (Ret)

The Bristol F2B, D8096, in the Shuttleworth Collection
Old Warden Aerodrome, nr. Biggleswade, Bedfordshire, England

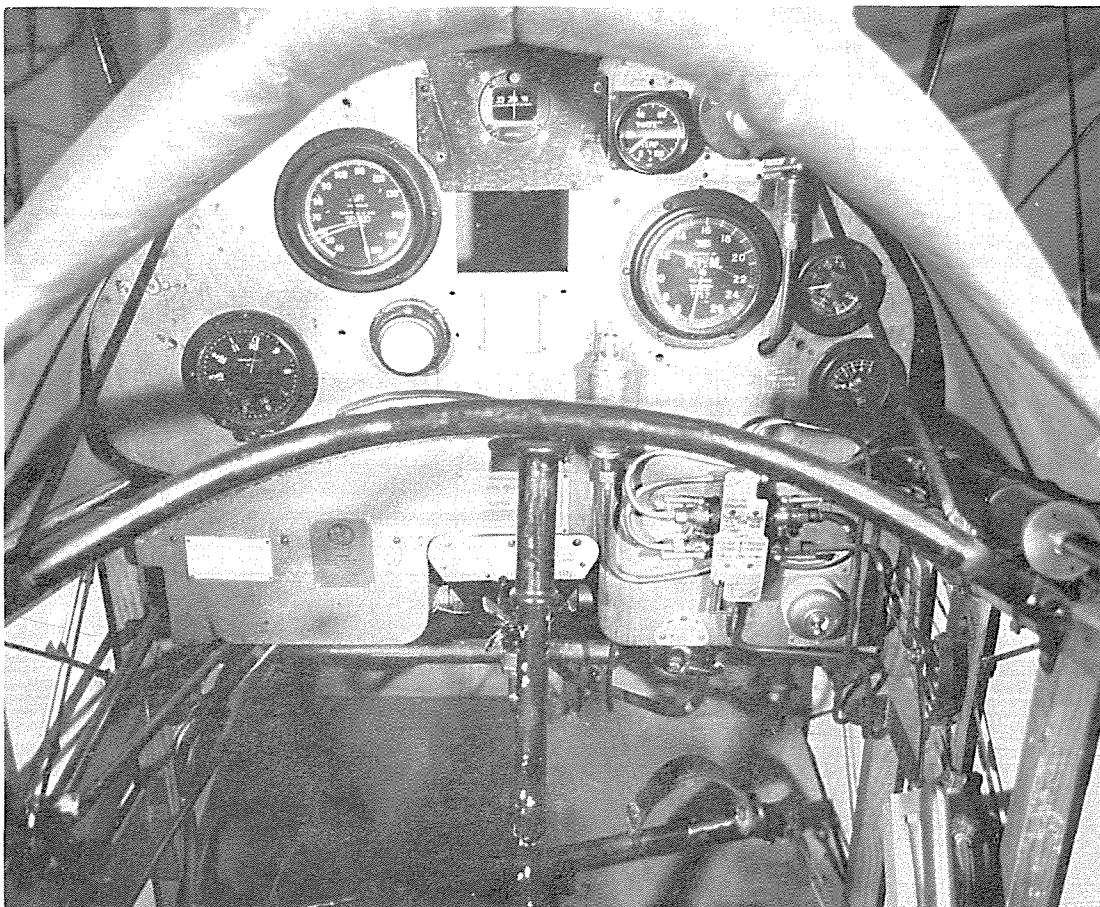
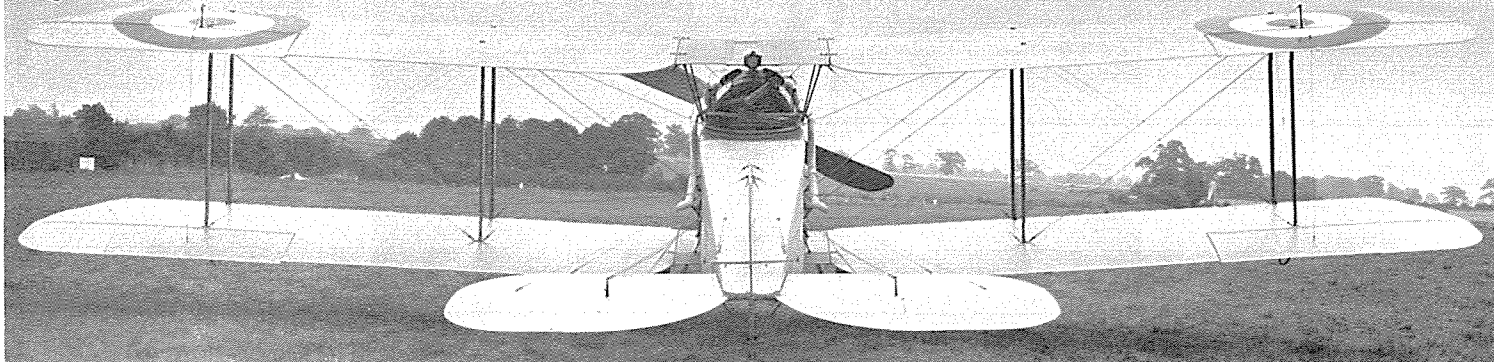


(Photo credits)
Top - Miss D.E. Wright
Center - Ronald Bennett
Bottom - Roger Wright





(Photo credits)
 Top - M.V. Handscombe
 Center - Ronald Bennett



The Shuttleworth Collection's Bristol Fighter, even at this time is close to the original configuration. Allowances have been made for the larger tires and minor modifications of instrument panel, and removal of armament except the rear machine gun, but structure and color scheme remain very close to its original. No brakes have been fitted so stopping is in the time-honored manner of digging in the tail skid. Also, the altitude control lever is never used in Shuttleworth's conditions of flight.

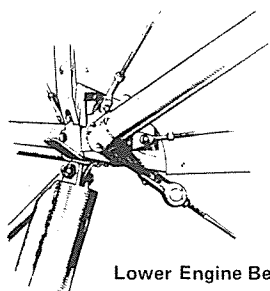
No fuel capacity gauge is fitted so contents of the tank must be determined by a dipstick which is stowed in a holder on the starboard side of the front cockpit. A cautionary note says, "DO NOT DROP IT IN THE TANK." The oil tank level should be about 3" below the bottom of the filler neck, checked immediately *after* the engine has been run (to ensure that a sump-full of oil is not pumped up to an already full tank and bursting it).

(Photo credits)

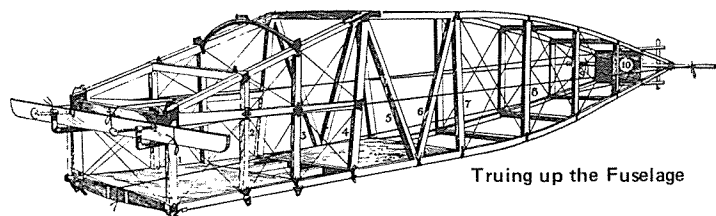
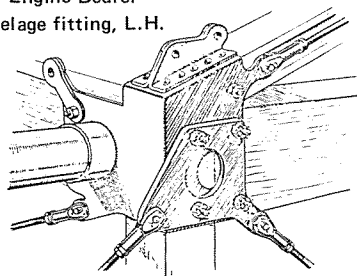
Top and bottom - Ronald Bennett
Center - M.V. Handscombe
Opposite page top - Bennett



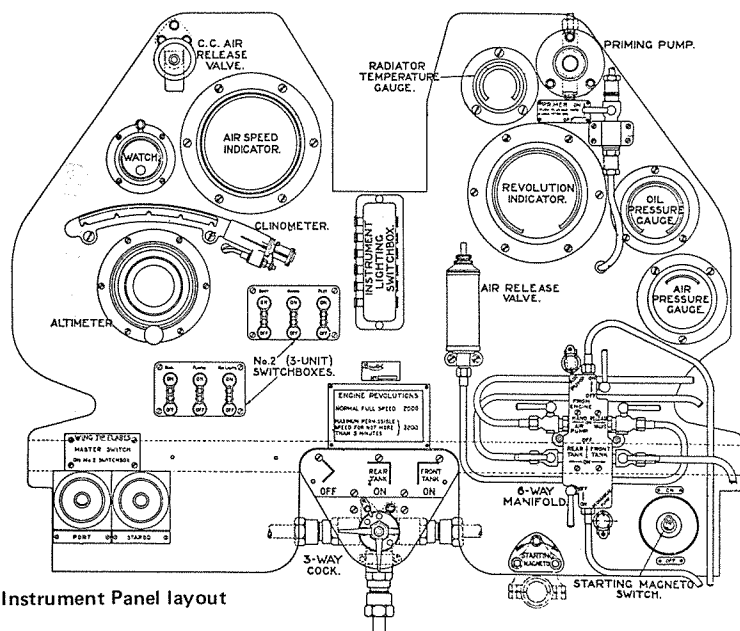
Upper Engine Bearer
to Fuselage fitting, L.H.



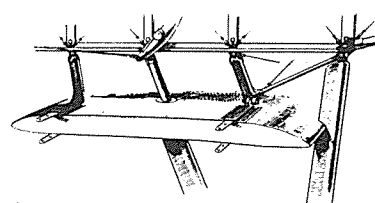
Lower Engine Bearer
to Fuselage fitting, R.H.



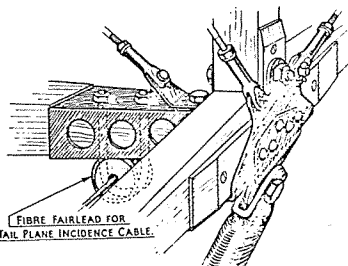
Truing up the Fuselage



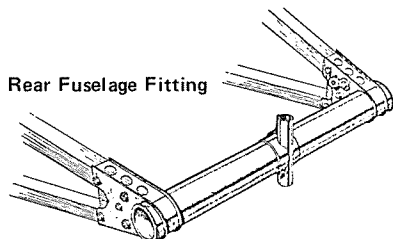
Instrument Panel layout



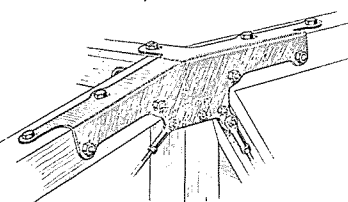
Attachment of Lower Center
Section and Landing Gear Struts, R.H.



Fuselage to Center Section Strut
attachment, L.H.



Rear Fuselage Fitting



Fitting at Upper Longeron break, L.H.

Sketches from Air Ministry
"Air Publication 866, 2nd Ed., June 1928, The Bristol Fighter Mk.IV"



THE SHUTTLEWORTH COLLECTION

The Bristol Fighter was one of the most famous aircraft of WWI, and a flying example is today one of the most well-known and popular in Britain. It belongs to the historic Shuttleworth Collection, an assembly containing one of every aeroplane in Britain dating before 1925 still in flying condition.

The Shuttleworth Trust, its controlling body, was formed and endowed by Mrs. Frank Shuttleworth on April 26th, 1944 in memory of her son, Richard Ormonde Shuttleworth, who was killed while flying at night with the Royal Air Force in 1940. Before the war many of the items forming the Collection had been collected and put in working order by Richard Shuttleworth, and its Bleriot, Deperdussin and Sopwith Pup had been flown regularly at air displays. Many of its automobiles were regular participants in the annual London-to-Brighton Veteran Car Run and most of its collection of early cycles had been put in working order. Shuttleworth's aim was that every item in his Collection should be made to work in the manner intended by its original designer. His successors have endeavoured in no little degree to expand the Collection in conformity with its Founder's aims.

A visit to the Shuttleworth Collection at Old Warden Aerodrome is a remarkable experience just to see the many aircraft in flying condition. On a day when there are flying displays the event can be the thrill of a lifetime. A visit to the Collection has been arranged as part of the A.A.H.S. tour to Great Britain in September and every attempt will be made to make this coincide with one of the flying displays.

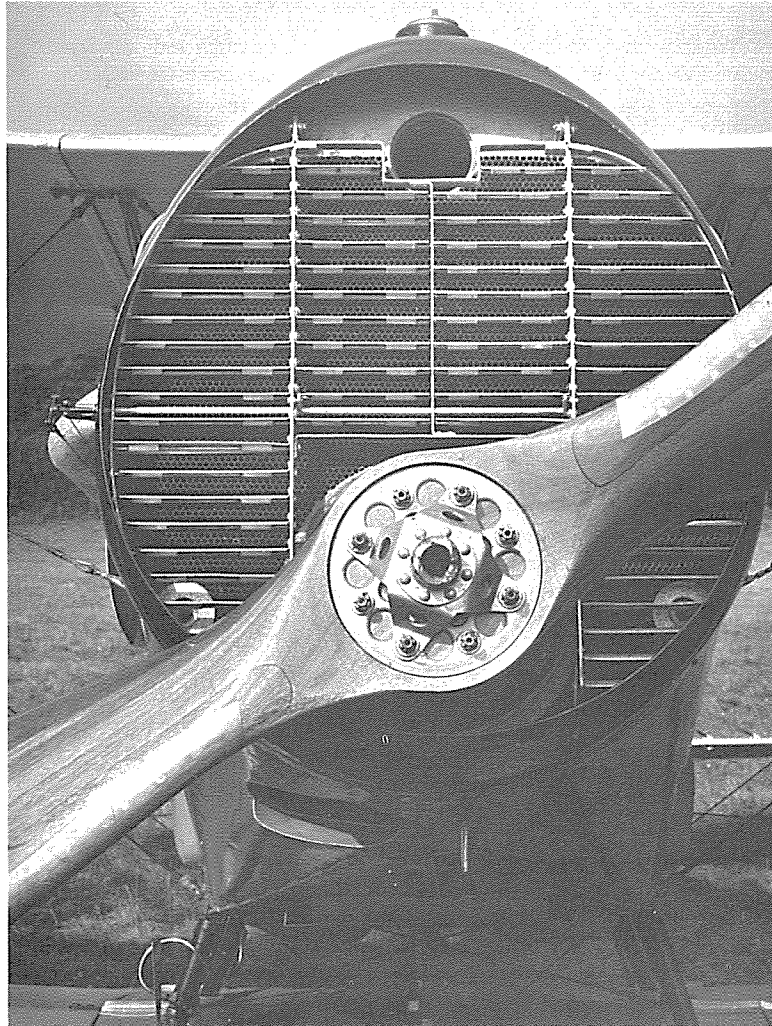
The Shuttleworth Veteran Aeroplane Society was formed in 1964 to enable persons with more than a passing interest in the preservation of airplanes to participate. The income from memberships in S.V.A.S. goes toward the support and further expansion of the Collection. Members of the S.V.A.S. are entitled to access to the museum and the library, tickets for admission to three special events each year, and the S.V.A.S. newsheet, published occasionally as warranted. An annual Class "D" membership for one person is £2.10, or about \$5.25. £1.05 of this is donated to the Trust for restoration purposes.

BRIEF HISTORY OF TYPE

The Bristol Fighter was the product of the City of Bristol, which has figured prominently in many stirring events of British history, with many notable citizens. Sir George White, a native of Bristol, was well known to the engineering world by his long connection with successful rail and tramway undertakings. Having foreseen the possibilities of the new form of aerial locomotion he decided to turn his enterprise and ability into the work of pioneering these new vehicles of the air and thus founded the British and Colonial Aeroplane Company.

The first commercial venture was the Bristol Boxkite, a reproduction of which is now among the exhibits of the Shuttleworth Collection and flies regularly at the flying displays. Thirty or more designs followed until, in 1917, the F2B, known generally as the Bristol Fighter, came into being and appeared on the Western Front, where it was conceded to have been the best all-around fighting machine of the Great War. It combined the best qualities of both single- and two-seat fighters, had a reasonably high top speed, excellent maneuverability, and considerable structural strength. With pilot and gunner seated back-to-back and working almost as one man, it had a high standard of efficiency. It was popular with all the crews and became affectionately known as the "Brisfit" or "Biff."

The first assignments to France were not immediately successful because pilots failed to exploit its capabilities by continuing to fly it in the previously accepted manner for two-seaters. These difficulties were soon overcome, and it was soon regarded with respect on both sides, serving in the roles of Offensive Patrol, Escort Fighter, High Speed Reconnaissance, Contact Patrol, etc. In process of its development it had several engine types; Hispano Suiza, Siddeley Puma, Wolseley Viper, and Sunbeam Arab, but found its greatest success with the Rolls-Royce Falcon.



(Ronald Bennett)

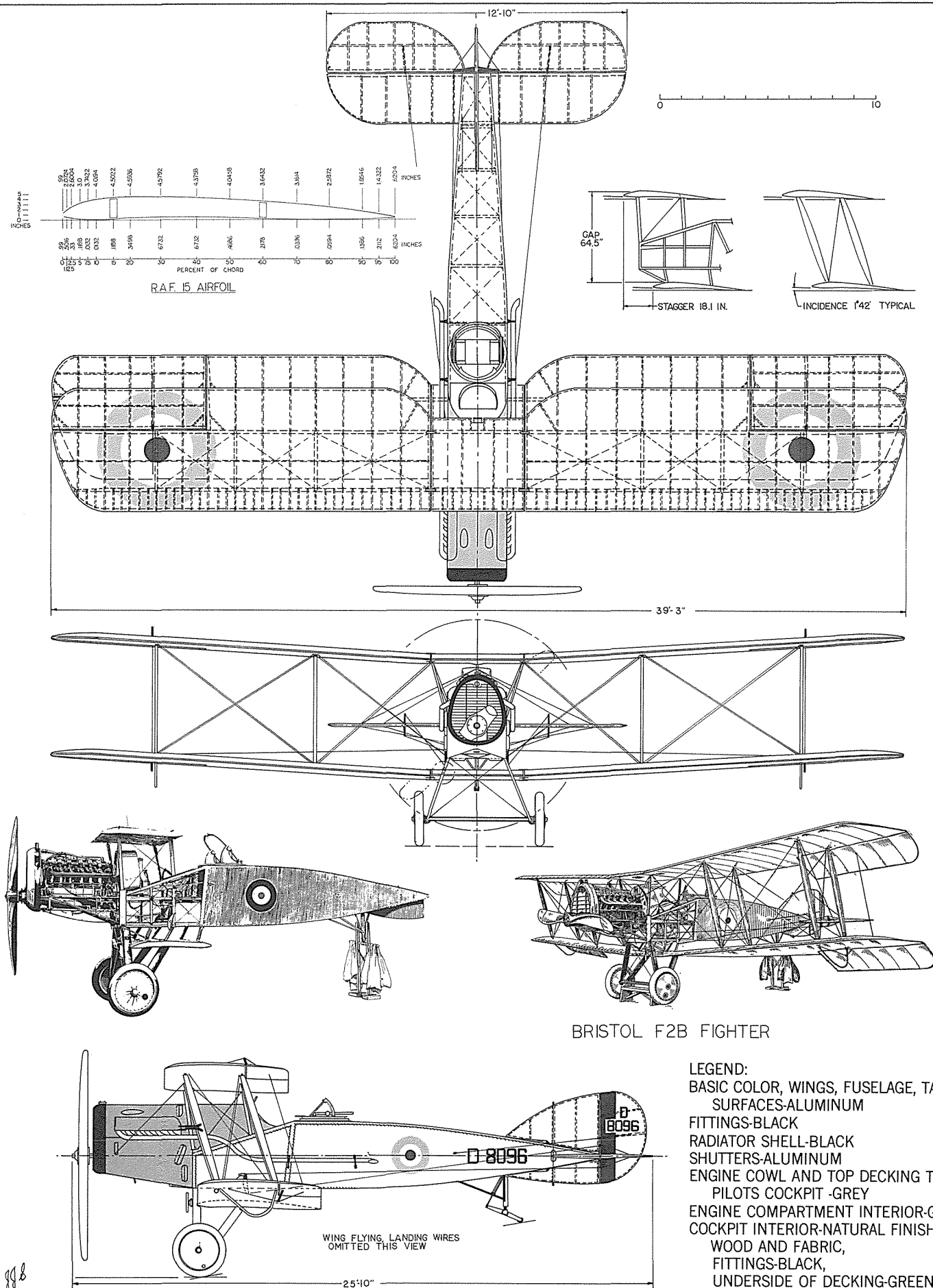


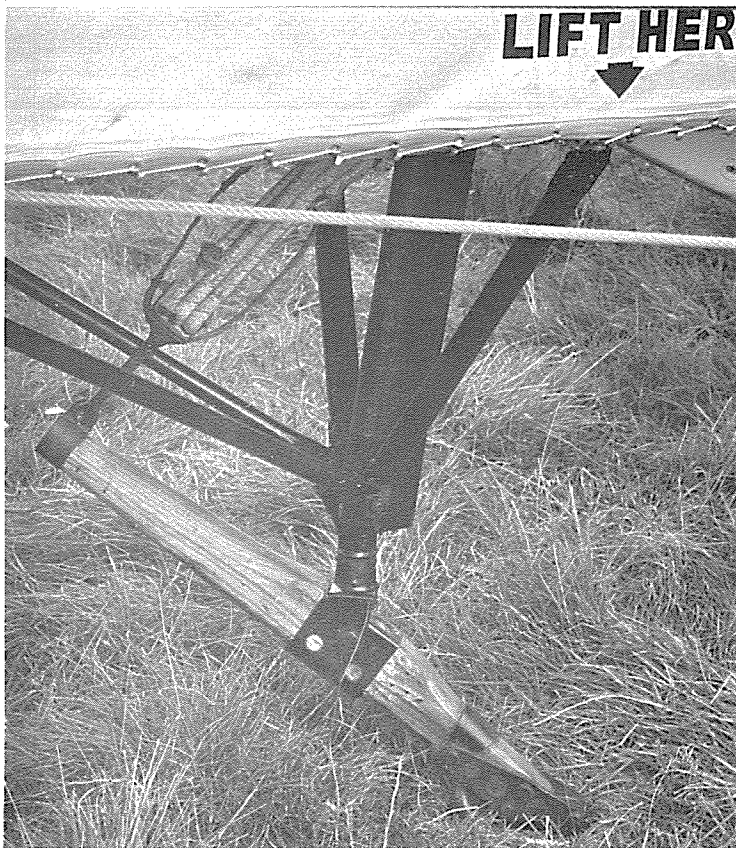
After the War the Bristol Fighter continued as a standard light bomber and Army Cooperation machine until it was superseded by the Westland Wapiti and Armstrong Whitworth Atlas airplanes in 1930. A total of about 3,000 had been made by 1918. Their cost: Airframe without engine, instruments or armament — £1,350; Engines: R-R Falcon — £1,210; Sunbeam Arab — £1,350; Hispano-Suiza — £1,017.

The Bristol Fighter was chosen also for manufacture in the United States, with somewhat less than success, as related in the following article, however, this was occasioned by the uncertainty of the administration of the U.S. war program. In the hands of British and other United Kingdom forces an enviable record was set up during the War. After the War it was a most efficient instrument in the control of mandated areas in the Middle East by British Forces.

The Bristol organization gained a distinguished reputation as builders of many other successful airplanes, the Bristol Monoplane, the Bulldog, and during WWII, the Blenheim, Bolingbroke, and Beaufighter series. After the War, with focus on commercial possibilities, there was the Brabazon that, although not produced in quantity, was a far-sighted project in large aircraft from which much was learned. The Britannia followed, and the 79 of these flew over 222 million miles in 717,000 flying hours with more than 3 million passengers. There were also the Bristol Freighter and the Wayfarer, and ultimately, after amalgamation onto the British Aircraft Corporation, the Concorde emerged from the same factory as had been the seed bed of this famous line of aircraft.

Mention must also be made of the many and famous engines of Bristol design and manufacture, The Jupiter, Pegasus, and Mercury poppet valve types, the Centaurus and Hercules sleeve-valve engines, and the Orpheus and Olympus gas-turbines.

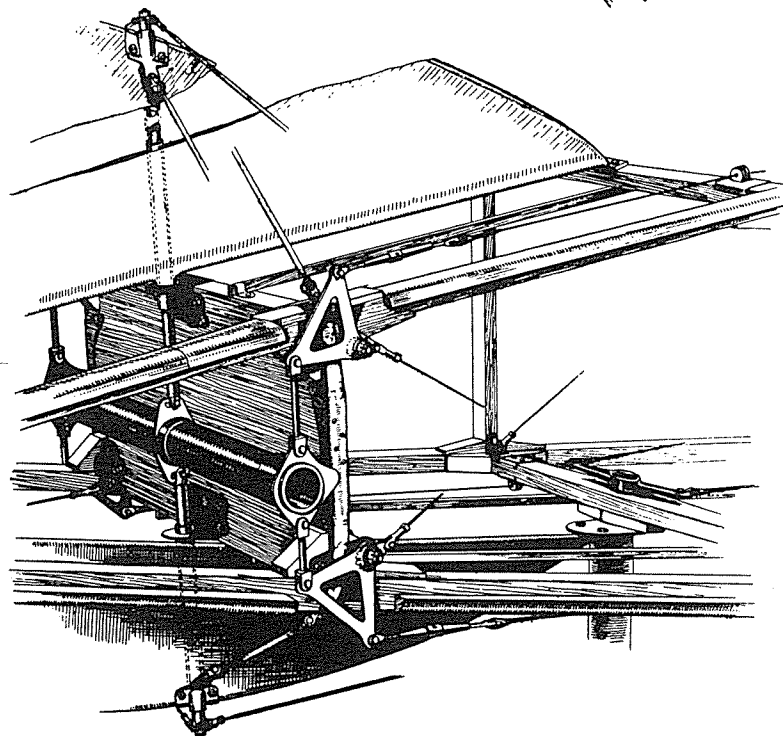
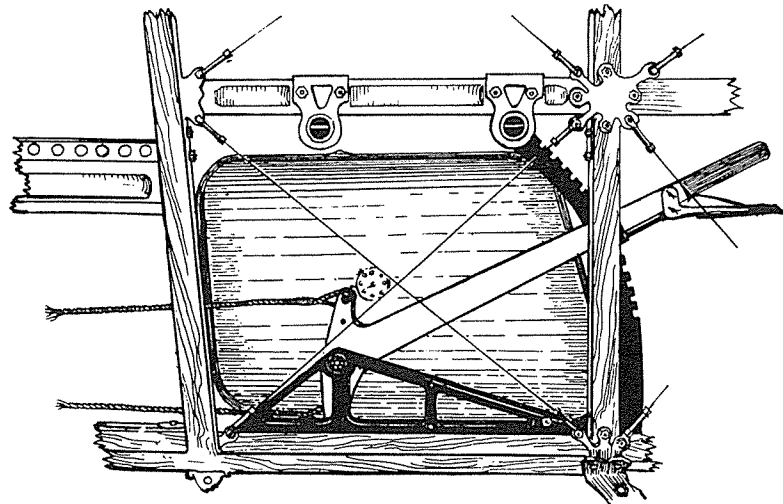




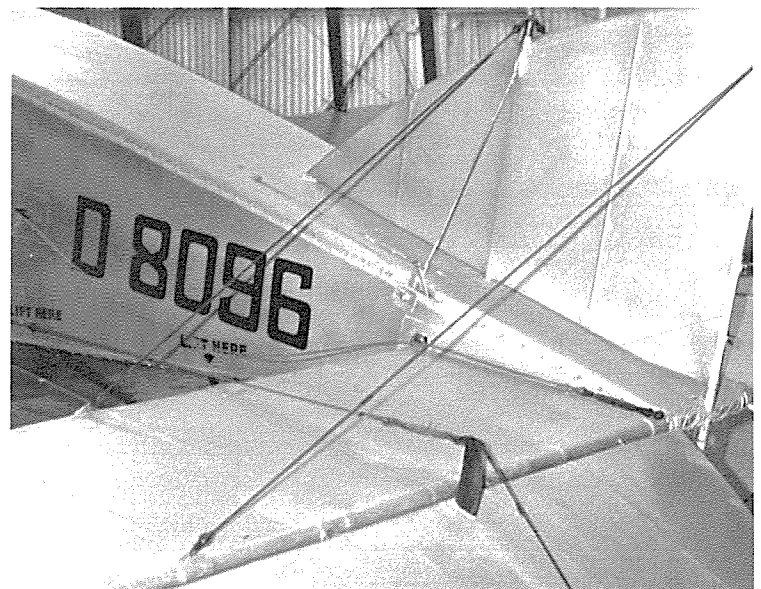
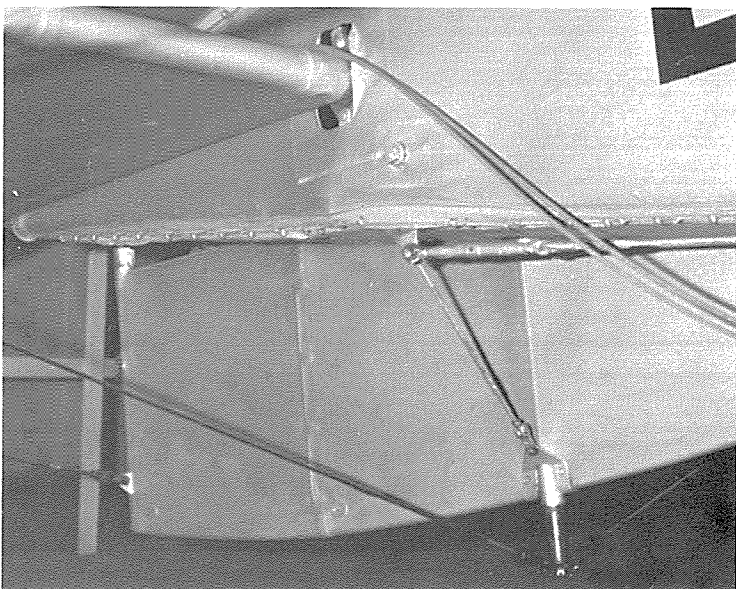
In designing the Bristol F2B, Frank Barnwell planned it as a Fighter from the very beginning, with pilot and gunner back-to-back, sitting high between the wings, with a flat rear fuselage and low vertical tail. Thus part of the vertical stabilizer was below the fuselage, necessitating the pylon-mounted tail skid shown above. In the original version the tailskid was controllable by the rudder bar, but later modified to fixed positions.

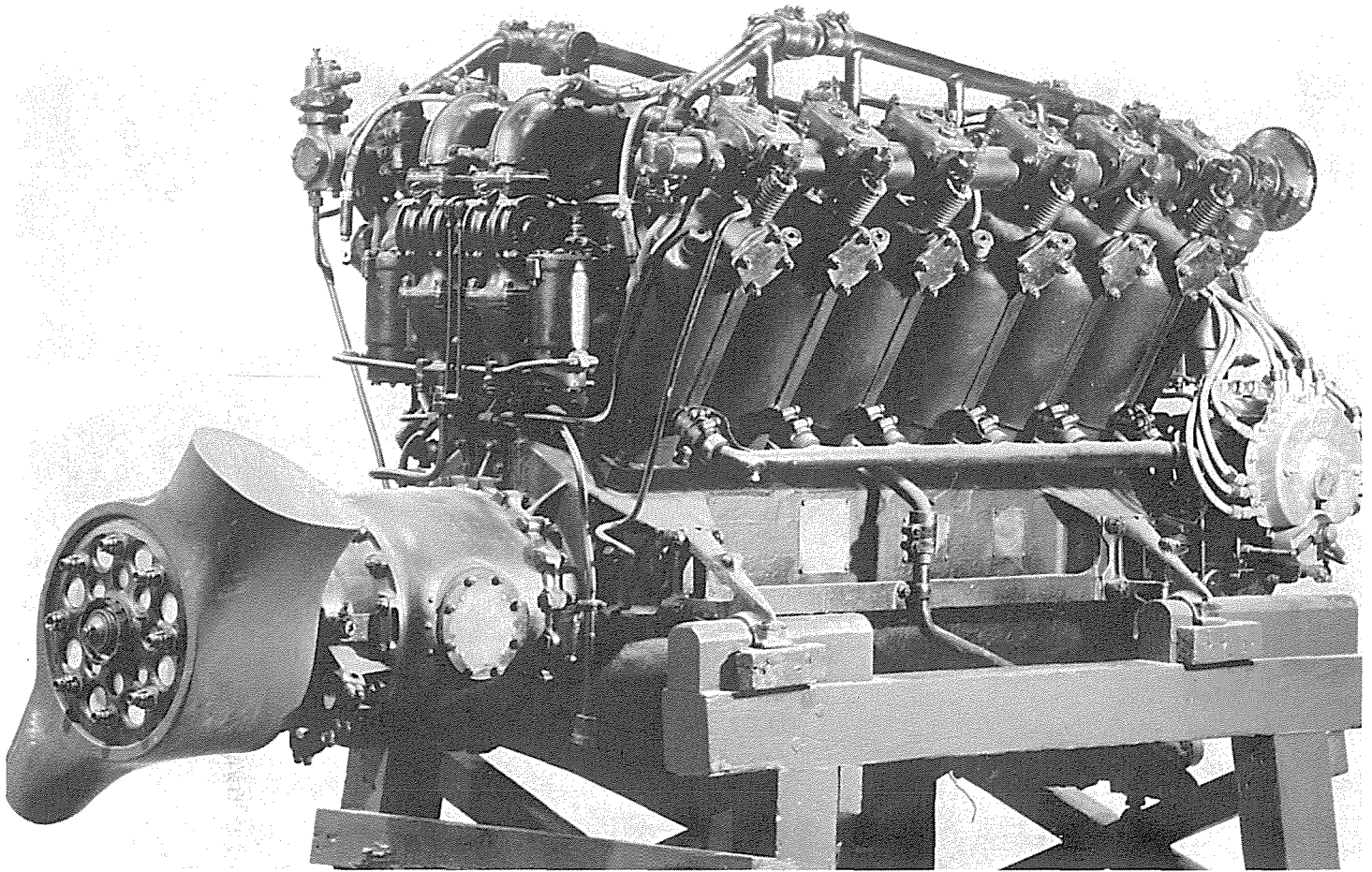
Control of incidence of the horizontal stabilizer was ingeniously worked out so that it would pivot at the very rear of the fuselage. The forward frame member of the stabilizer and its bracing wires moved up or down as a unit, controlled by a handle in the starboard side of the pilot's cockpit, not disturbing the fixed position of the vertical fins. The horizontal stabilizer forward bracing wires were rigged against a vertical post passing through from top to bottom. The rear bracing wires were rigged against the vertical post made by the rear of the vertical fins.

Thus the combination of 175 h.p., all-up weight of around 2,700 pounds, and top speed of around 120 m.p.h., gave an outstanding two-seat fighter.



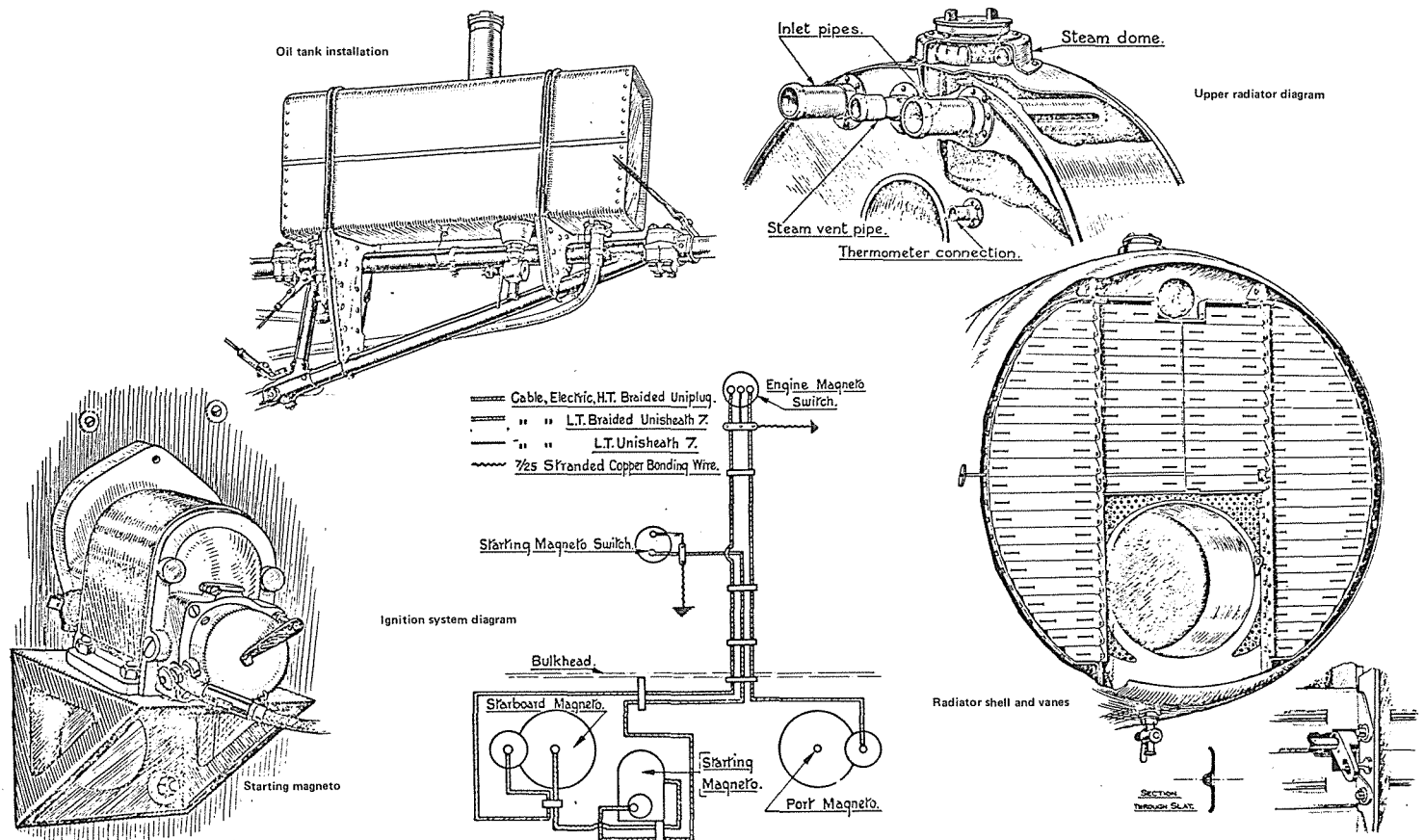
Variable incidence gear arrangement.



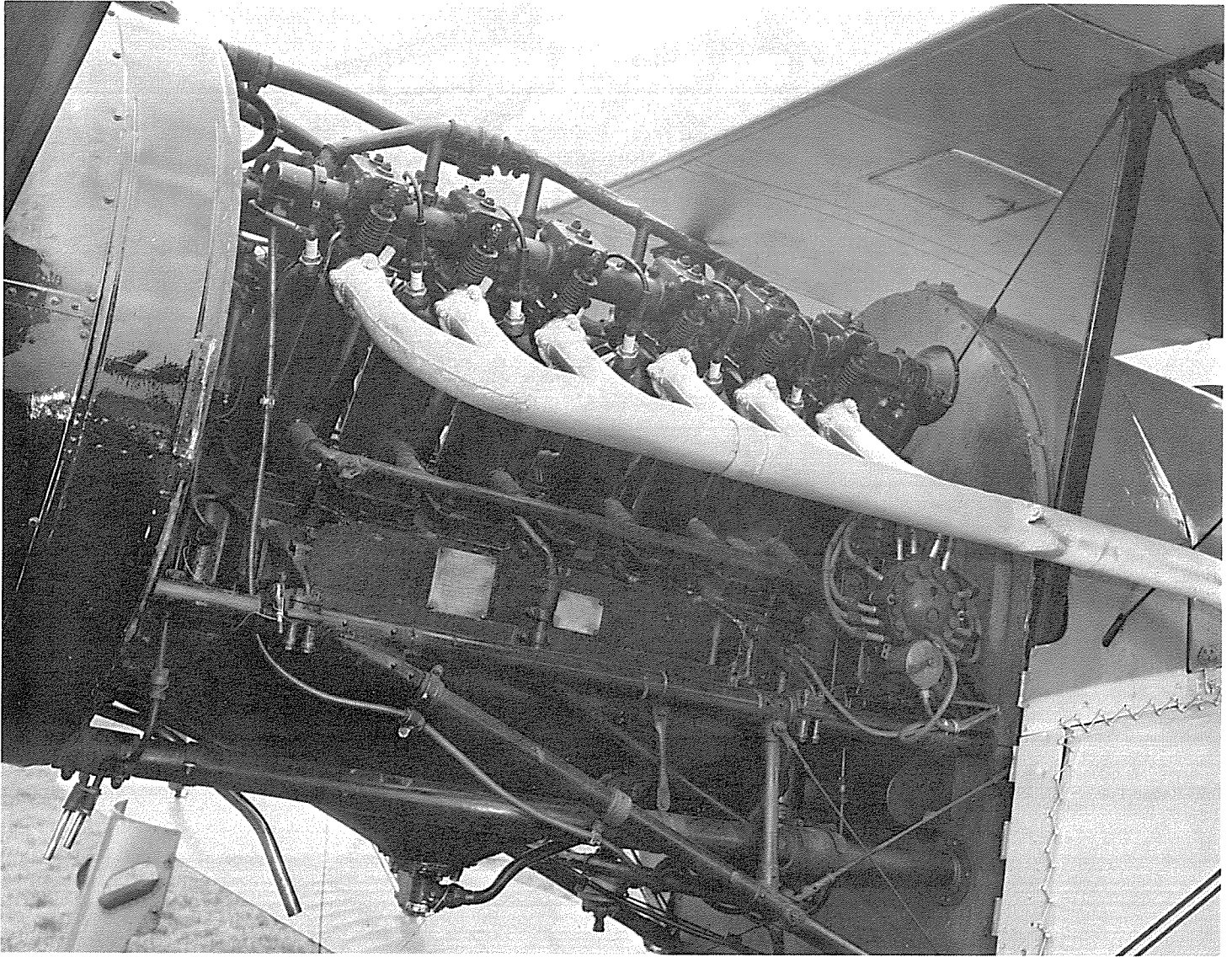


Rolls-Royce Falcon III, 275 h.p.

(Photo - Peter Saunders, courtesy of J.M. Bruce)

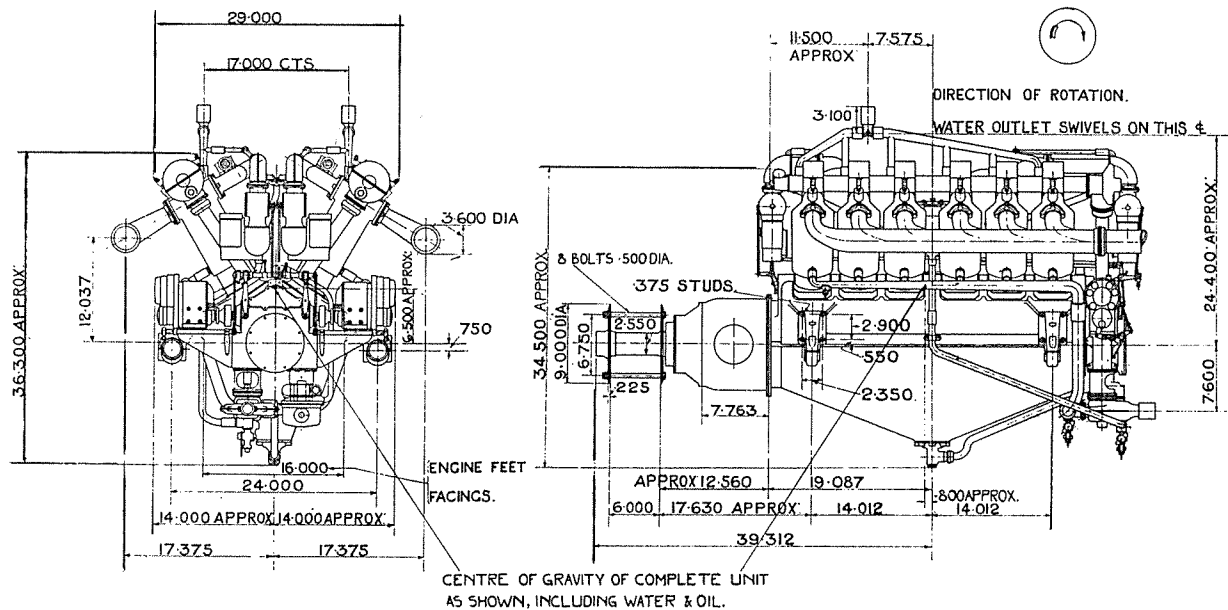


Ref: Air Ministry Publication No. 866, June 1928

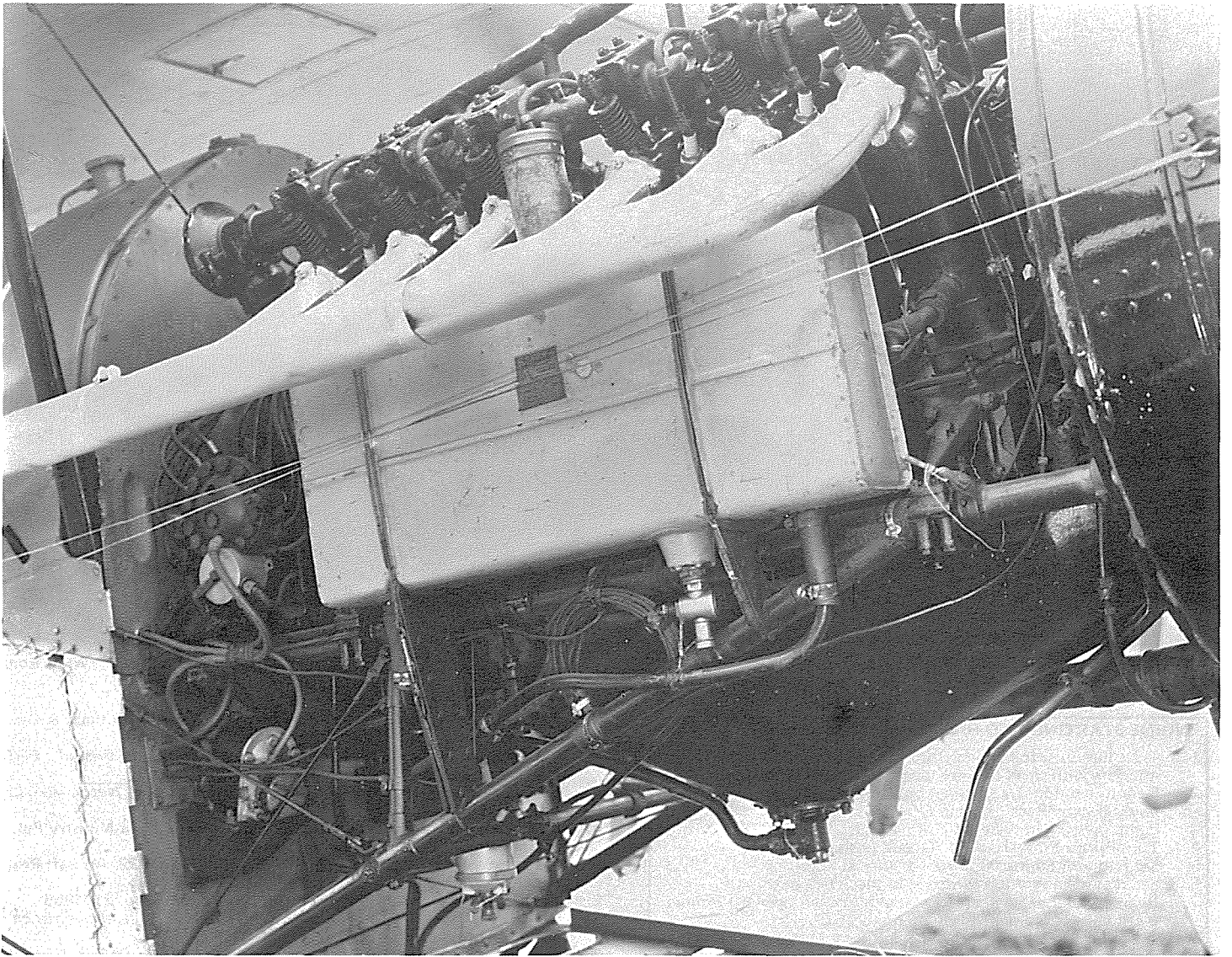


Engine installation in Bristol Fighter, Shuttleworth Collection.

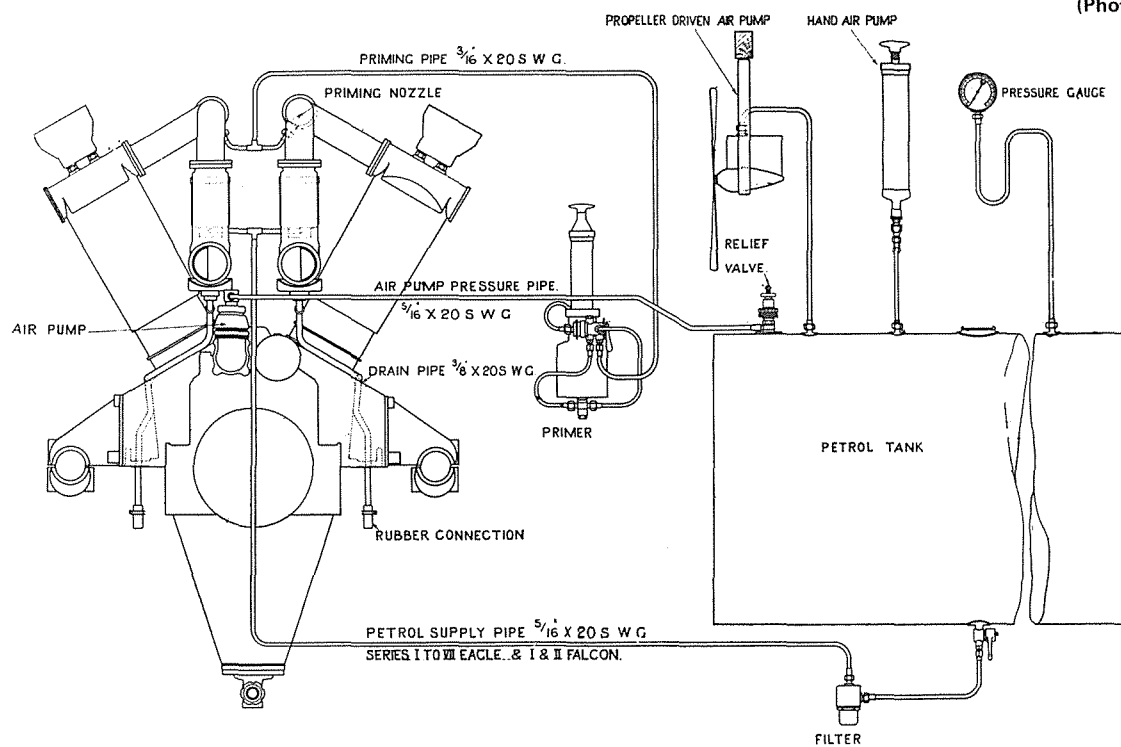
ENGAGEMENT FACE OF
TACHOMETER DRIVE.



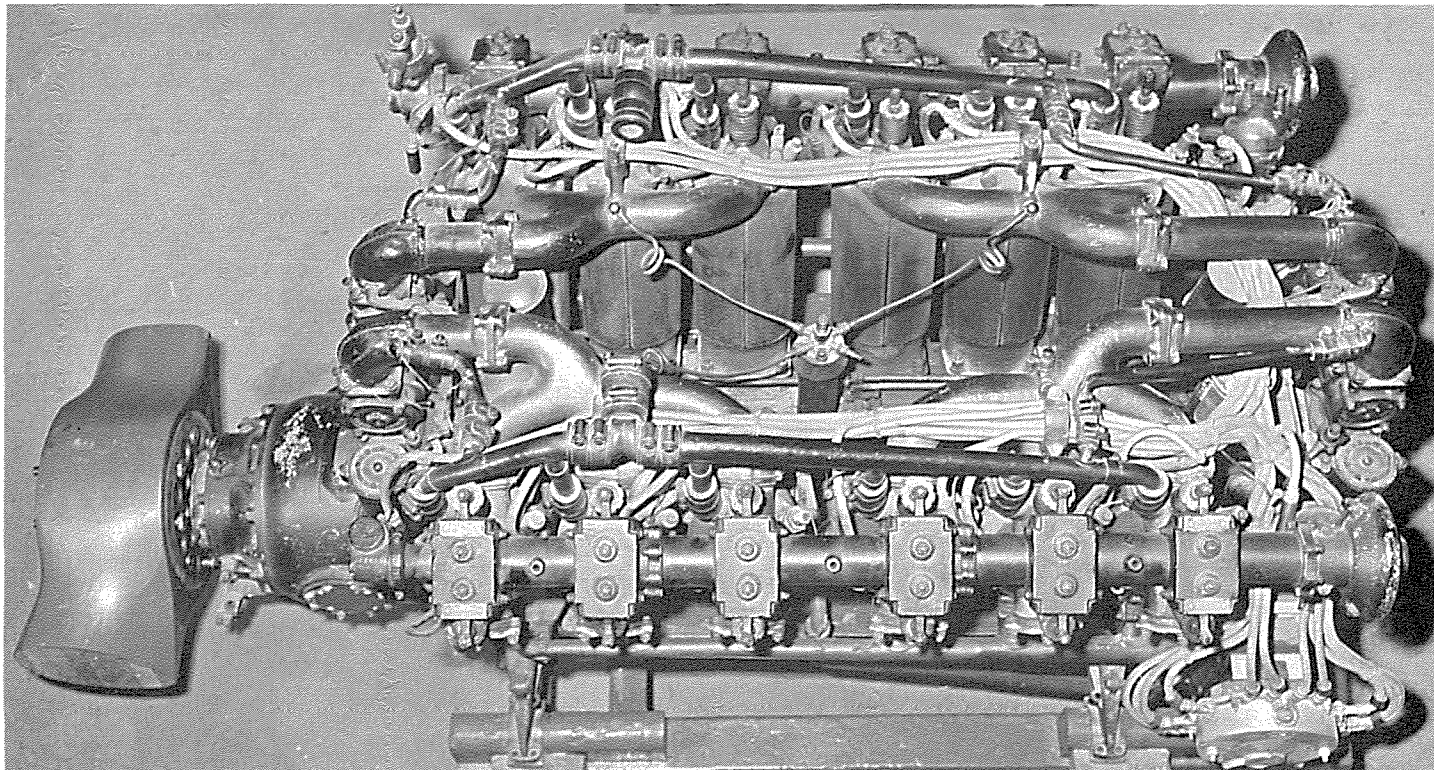
General Arrangement of Rolls-Royce Falcon III engine. (Ref: Rolls-Royce Aero Engine Instruction Book)



(Photos — Ronald Bennett)



Fuel System diagram,
Rolls-Royce Eagle
and Falcon engines.



Top view of Rolls-Royce Falcon III engine on portable stand.

(Photo - Miss D.E. Wrightson)

THE ROLLS-ROYCE FALCON ENGINE

ENGINE STARTING AND HANDLING: (In sequence)

1. Turn fuel cock to Main or Bottom Tank as appropriate. Do not interfere with small transfer taps at R.H. side of the dash.
2. Retard ignition by pulling bottom lever in Throttle Lever Assembly to "Back" position.
3. Pump pressure in system to 3 to 4 p.s.i.
4. Turn Primer Pump cock to "Open" position.
5. Set Radiator Shutter Control to "Closed" position.
6. See that Main Ignition Switch is in the "Off" position.
7. Instruct two helpers to turn the propeller over 8-12 times, meanwhile pumping the Primer Pump slowly.
8. Turn Primer Pump tap to "Off" position, turn Starter Magneto Switch to "On" position.
9. Helpers set the propeller on "swinging" position and on the words, "One-Two-Three-Go!", pull the propeller smartly over.
10. On the word "Go" the pilot switches the Main Ignition Switch to "On" and winds the handle of the starter magneto vigorously and catches the engine on the throttle as it fires. Switch off the starter magneto. Note: A helper should hold the tail down during the starting operation. (On the starboard side to avoid a wet shirt from venting coolant).
11. Advance the ignition lever to the "Forward" position. Warm up the engine at 1200 RPM to water temperature of 70° C. and adjust Radiator Shutters as appropriate.
12. Check both magnetos and run engine up to 1900 RPM, oil pressure of 40 p.s.i.
13. In flight - Cruise at approximately 1800 RPM, operate Radiator Shutters to maintain temperature at 80° C.

Nameplates on the R-R engine in the Shuttleworth Collection Bristol Fighter give the following information:

- | | |
|----------------|---|
| Large plate — | Rolls-Royce England
Series III Falcon No. 9
Normal Engine RPM — 2000
Maximum permissible RPM — 2300
Normal Airscrew RPM — 1179
Maximum Oil Pressure — 20 lbs. sq. in.
R. H. Tractor |
| Center plate — | Patent Numbers |
| End plate — | (Both sides) Magneto Firing Order |
| Gear Case — | (Port side) Removal Instructions
(Starboard side) Replacement Instructions |

At right, Wing Commander T.E. Guttery, RAF (Ret), M.B.E., C.Eng., A.F.R.Ae.S. in charge of Research and Archives for the Shuttleworth Collection at Old Warden Aerodrome, Biggleswade, Beds., England.

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2. The British & Colonial Aeroplane Co. Ltd., *The "Bristol" F2B Instructions & Parts List*. Filton: Bristol, 1917.
3. H.M. Stationery Office, *Royal Air Force Technical Notes, A - L*. London: 1918.
4. H.M. Stationery Office, *The Bristol Fighter Mk. IV*. Air Ministry Publication No. 866, June 1928.
5. Chaz Bowyer, *Bristol F2B Fighters: R.A.F. 1918-1932*. Aircraft Profile No. 237, Hylton Lacy Publishers, Ltd., 1972.
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7. Harald Penrose, *British Aviation: The Great War and Armistice*. London: Putnam & Co., Ltd., 1969.
8. Jones, H.A. and Raleigh, Walter. *The War in the Air, Official History of the War*. Oxford: Oxford University Press, 1937.
9. Bruce Robertson, *British Military Aircraft Serials, 1912-1969*. London: Ian Allan Ltd., 1969.
10. For basic three-view drawing, courtesy of J.M. Bruce, "The Bristol Fighter F2B". *Flight Magazine*, 7 November 1952, p. 589. Also *Warplanes of the First World War, Fighters, Vol. 1*. MacDonald & Co.
11. Basic dimensions: Op Cit. Bruce, *British Aeroplanes*.
12. Photographs provided by W/Cdr T. E. Guttery.

