Rolls-Royce

New Version with Three-speed Blower

Existing Installation Clearanc

THOUGH basically similar to the Rolls-Royce Griffon 65 engine (described in detail in *Flight* of September 20th), the Griffon 130 differs from the earlier model in having a three-speed, two-stage supercharger and a Rolls-Royce fuel-injection system to replace the Bendix-Stromberg wartime installation. These two innovations are to be regarded as important technical advances in that they enable over 2,000 b.h.p. to be maintained to 20,000ft.—a most remarkable performance for an engine of only 37 litres capacity.

These new developments are embodied in a new series of Griffon engines starting at "101" through Series "121" up to "130," all being under the designation "Griffon 3 SML" to denote that the supercharger incorporates a three-speed gear. Series 101 engines will be fitted with a reduction gear of 4.45 ratio for a single airscrew and Series 121 and upwards with 0.44 ratio reduction gears for contra-rotating airscrews.

It will be appreciated that the object of having alternative driving speeds for a supercharger is to enable the greatest power to be developed from the throttled sea-level power in M.S. gear up to an altitude at which the throttle is fully open and the maximum power is being delivered. Similarly, when F.S. gear is engaged, the engine is again throttled until the rated altitude in this gear is reached. The respective ratios determine the sea-level and altitude performance of the engine, the M.S. ratio being a compromise between sea-level and medium-altitude power, whilst the F.S. ratio is designed to give optimum power at higher altitudes.

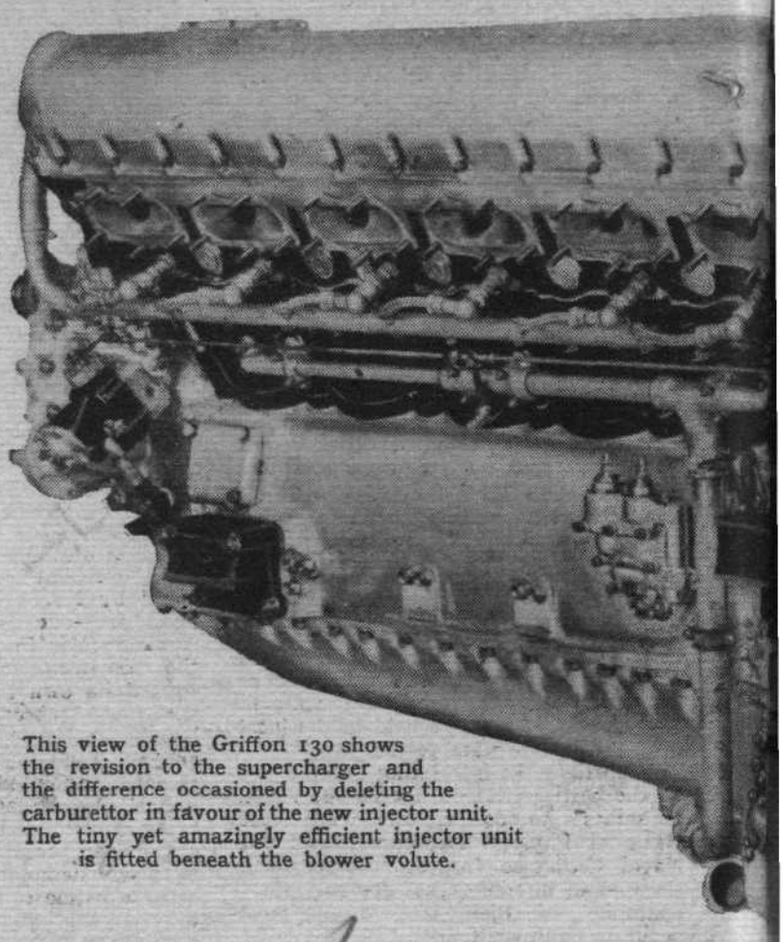
Performance Increased at all Levels

There must, however, necessarily be a transitional stage between the peak point of M.S. power and the altitude where F.S. gear can advantageously be used, where the power of the engine falls, due to the compromise in the selection of drive ratios. This unfortunate transitional stage is somewhat negatived by the three-speed blower, for not only does this refinement increase the power at medium altitudes but it also improves the performance at sea-level and, additionally, makes available increased power at higher altitudes, one engine thus becoming suitable for sea-level, medium-altitude and high-altitude operation.

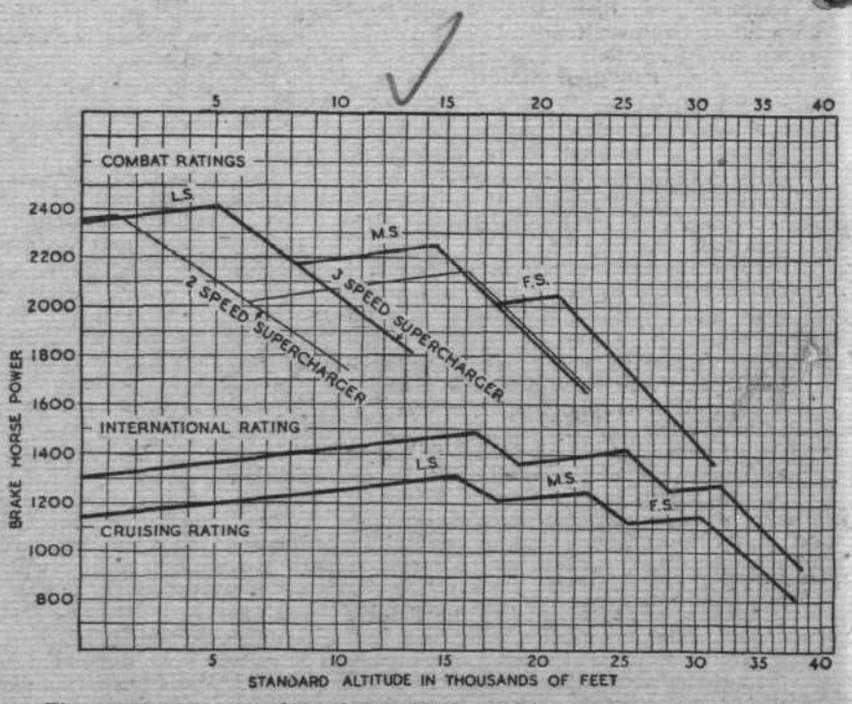
In this connection, whilst we must agree that it is an excellent thing to have the greatest possible output both for take-off and at extreme altitude, we trust that the advent of this new engine does not presage the passing of the specialist, single-purpose aircraft. It is, we feel, by far the better plan to provide both low-altitude and high-altitude machines rather than attempt to make one aircraft perform both functions.

It is interesting to compare the combat rating power curves for the three-speed Griffon with those of the earlier two-speed engine. These show that the rated altitude on the latter engine in L.S. (low supercharge) gear is 5,000ft. as against 1,250ft. in M.S. gear on the two-speed engine. In M.S. gear the rated altitude for the Griffon 130 is 14,500ft., and is, therefore, only short of the F.S. rated altitude on the two-speed Griffon by 1,500ft., whilst in F.S. gear the three-speed engine has increased the rated altitude to no less than 21,000ft., representing a gain of some 5,000ft.

Similar approximations to the ideal are obtained for maximum climbing and cruising conditions. In L.S. gear at climb rating, the



This view of the Griffon 130 shows the revision to the supercharger and the difference occasioned by deleting the carburettor in favour of the new injector unit. The tiny yet amazingly efficient injector unit is fitted beneath the blower volute.



These power curves show how closely maximum power is attained throughout the operating range