PURSUIT ENGINES IN AMERICA.

The December issue of "The Wright Engine Builder", published monthly by the Wright Aeronautical Corporation of Patterson, N.J., contains an article on "Pursuit Engines in America", in which, after making a comparison of the performance in flying level and climbing of a plane, first equipped with a 12-cylinder engine and then with the Wright 8-cylinder engine, the claim is made that the Wright Aeronautical Corporation, manufacturing the Wright engine (the Americanized Hispano-Suiza) are building the most efficient pursuit type engine in the world.

The article, quoted in part, is as follows:

"Whatever our accomplishment has been during these past three years is expressed through the medium of the performance of our H-3 engine, which is now current product. After a survey of the field abroad, which has recently been made by our Mr. Peterson, we believe that the French Hispano is still the most efficient and effective pursuit type engine which they have on the other side. We all know that during the war the Hispano engine was the last word in pursuit equipment.

Our competition in this country in the development of a pursuit engine has been in the 12-cylinder type engines. Our Engineering Department has always felt that there was theoretically a very considerable advantage in eight-cylinder engines compared with the 12-cylinder type.

In order to determine the performance, if any, on plane performance between eight-cylinder and twelve-cylinder engines, a study has been made of the weight per horsepower of each type. The effects of the difference in weight per horsepower have been studied from a comparative test in an XBIA ship, equipped with both types of engines.

Three representative makes of engines have been taken for this comparison, two of them "twelves" (Packard A-1237 and Curtiss C-12) and one an "eight" (Wright). In order to make the weight comparison fair to all three engines, a

common mean effective pressure and crankshaft speed has been assumed. The actual dry weights of the engines have been taken, and the weight per horsepower figured from this data. Speeding up the engines or changing their compression ratios will simply change their power proportionally, so that the weights per horsepower are comparative.

The power plant weight is figured by adding to the engine weight dry, the weight of the water in the engine in each case, plus the weight of water and radiator figured at .65 lbs. per horsepower. The total power plant weight thus obtained is divided by the horsepower shown. It should be noted that one of the "twelves" mentioned has been found to require a 30% larger radiator in service, and the equivalent increase in the amount of water carried to cool it as effectively as the "eight". Due to the greater area of water-swept surface in a "twelve", such an increase is to be expected. Naturally, it still further increases the advantage of the eight-cylinder type, when plane performance is considered, as a larger radiator not only means more weight, but more head resistance.

In the light of the above comparison, a recent test made at the McCook Field has proved in a most practical way the advantages claimed. For the purpose of studying the comparative performances, those making the test used an XBIA ship, equipped as required for Corps Observation, with an endurance of one-half hour at sea level and four hours at 10,000 feet, with both types of engines. From the data obtained it can be readily seen that there is a tremendous advantage to be gained by the use of an eight-cylinder type of engine for pursuit work, due to the increase in performance obtained. The ship having an eight-cylinder Wright engine has the following characteristics at the fighting altitude of 15,000 feet:

(1) Climbs to that position in 22% less time than the twelve-cylinder type.
(2) Is climbing 64% faster at that altitude.
(3) Is 7% faster in level flight at that altitude.

The actual weight difference between the ship powered with the eight-cylinder and the twelve-cylinder type is 197 lbs., the ship in each case carrying the same useful load and having the same endurance. The detrimental effect on the plane performance of the additional weight of approximately 200 lbs., involved by the use of the twelve-cylinder type, is clearly shown. Besides the superior performance, the eight-cylinder type enables the plane to maneuver more rapidly, due to its compactness, and is naturally much easier to overhaul than the twelve, due to its fewer parts.

In view of the above, we believe we have the right to feel that we are building the most efficient pursuit type engine in the world, and that this engine is now available for the use of our military and naval program."