

Installation and Cowling of Wright "Whirlwind" Engine

THE installation and cowling of the air cooled radial engine is an important feature and has a direct bearing on the satisfactory operation of the power plant considered as a whole. No general rules covering all conditions can be laid down, although experience has proven certain general principles as satisfactory. The Wright Company maintains a Plane Engineering Department whose services are available to recognized airplane designers for consultation and suggestion on the proper mounting, cowling and installation of Wright engines. This department is experienced in a wide range of approved engine mounts and it is desirable to submit all proposed designs for their suggestions and comment.

ENGINE MOUNTING The metal fuselage structure is now almost universally used in modern military and commercial aircraft. In the same way, the metallic engine mount is considered the best practice and gives an almost ideal structure for the radial air cooled engine, since ample accessibility is obtained for accessory adjustments behind the engine, and suitable bearing supports are available for the oil tank, starter-handle, gasoline strainer and other accessories.

Either a flanged plate, or a circular bent tube engine mounting ring is good practice. In case the latter is used, the engine bolts can be held by suitable clips welded to the ring, or by running them directly through the ring tubing, after properly supporting the tube section by a short welded-in

tube whose inner diameter is slightly larger than the engine bolt. This short tube prevents crushing the ring section.

Either tubing or formed sheet bracing to the mounting ring is permissible. In either case the mounting ring braces from the longerons should be so placed as to form a series of triangles, one in each plane of the fuselage. If the tubing mount is used, the brace tubes in each of the four fuselage planes should meet at a point on the mounting ring. In case interference with the carburetor is encountered in the bottom fuselage plane, it is permissible to spread the brace tubes in that plane a distance of several inches.

OIL TANK

The oil tank should be located immediately behind the engine and as close to it as possible. For all ordinary purposes a capacity of five gallons is ample. The oil pipes from tank to engine should be short and direct, avoiding sharp bends which offer resistance to the free flow of oil. In case the airplane is to be used in extremely cold weather, that is, at temperatures below zero Fahrenheit, all oil lines as well as the oil tank should be lagged with asbestos sheet covered with doped fabric, thus preventing rapid loss of heat and improper engine lubrication through unduly thick oil. It is permissible to install the oil tank as high as twenty inches above the crankshaft center, since the oil will not drain into the engine when not in operation.

GASOLINE TANK

The fuel tank can be installed in any convenient location, gravity feed to the carburetor being preferred, but not required. As an accessory, an engine driven fuel pump may be obtained which feeds gasoline to the engine at adjustable pressure. With the airplane tail skid on the ground a head of at least 20" should be allowed so as to assure a steady flow of gasoline to the carburetor under all conditions.

COWLING

Cowling is desirable on all engines except those in use in tropical climates. Not only does it improve the airplane performance by better streamline, but it protects the engine crankcase from over-cooling, which tends to congeal the oil. It is impossible to set forth any rigid rules for cowling a Model J-5 engine since the individual requirements of various airplane designs are different. In general, it is desirable to allow for a blast of air on the cylinder barrels as well as on the cylinder head, but since there are several different ways of making such an installation, we strongly advise designers to draw up their own ideas of cowling and cowl lines and submit them to our Plane Engineering Department for comments and suggestions.

