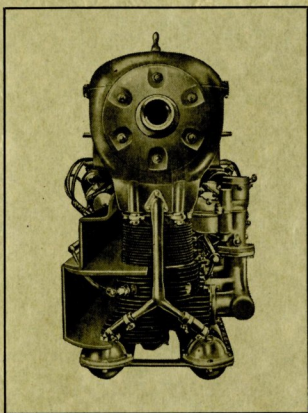


MARTIN MOTORS



Foreword

*I*T is very easy for a designer or manufacturer to indulge in self praise of his product—and perhaps at times it is perfectly justifiable. To see years of hard work at designing and testing culminated with success is very gratifying—However, to the aircraft manufacturer or purchaser of aircraft only those statements dealing with facts are essential
Therefore, this booklet of ours will state nothing but—FACTS.

THE GLENN L. MARTIN MOTORS COMPANY

The Specifications

A.T.C. No.—59.

TYPE—4 cylinder in line—Inverted Air Cooled.

BORE—4.5.

STROKE—5.250.

PISTON DISPLACEMENT—333 cu. in.

COMPRESSION RATIO—5.3 to 1.

H.P. NORMAL (Dept. of Commerce rating)—120 at 2100 R.P.M.

B.M.E.P.—136 lbs. per sq. in.

PROPELLER DRIVE—Direct.

PROPELLER SHAFT—S.A.E. No. 10 spline.

FUEL CONSUMPTION—.48 lbs. per B.H.P. Hr. (at full H.P.) (Official rating).

OIL CONSUMPTION—.010 lbs. per B.H.P. Hr.

WEIGHT (DRY)—265 lbs.

WEIGHT PER H.P.—2.20 lbs.

OIL PRESSURE—Dual gear pump.

FUEL PUMP—S.A.E. Standard mounting flange provided.

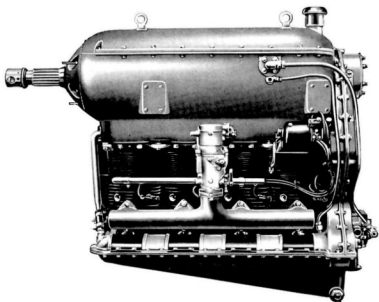
CAMSHAFT DRIVE—Triple strand chain and train of gears.
(Patent applied for)

IGNITION—Two Scintilla Magnetos. Standard equipment.

CARBURETOR—Zenith Down-draft.

TACHOMETER DRIVE—S.A.E. Standard 2:1.

STARTER—S.A.E. Standard 5-in. flange provided for mounting.



“The Martin-333”
Four-Cylinder---In Line
Air Cooled Aircraft Engine

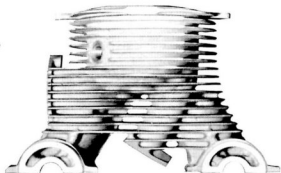
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The result of the Application
of
Balanced Design

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*E*XCEPTIONAL performance in an Aircraft Engine can only be obtained by careful attention to the design of each individual part—No single item contributing more than its share—Balanced Design has played an important part in the development of the Martin Aircraft Engine.

The Cylinder Head with its special exhaust outlets, its integral camshaft bearings and valve gear, its combustion chamber design, the shape and size of the valves, all combine to make the power output of the Martin Engine—MORE PER CUBIC INCH—through its even temperature and expansion. Patents are pending on this head design.



The Pistons are trunk type, Aluminum alloy with four rings, three compression and one oil scraper.

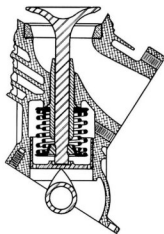


The Camshafts of which there are two, one for intake and one for exhaust, are located under the head. Each camshaft is supported by eight bearings



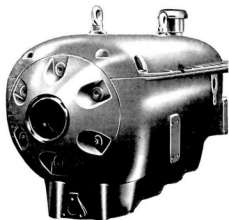
and is driven by a triple strand chain and train of gears. The camshafts are interchangeable.

The Valve Mechanism of the Martin engine deserves more than just casual mention. It is a rather new departure from conventional aircraft engine valve gear. The valves are actuated directly by the cams through lifter cups of Nitralloy Steel. The cams strike the lifter cups a trifle off center, causing the cup to rotate each time it is struck. The valve springs are both wound the same direction and each time the valve operates these springs have a tendency to twist the valve on its seat, thereby equalizing the seat. Two oil ducts are located in the cylinder head and



The Facts

The Crankcase is a two-piece, heat-treated magnesium casting of semi-elliptical form divided above the center line of the crankshaft. The inherent strength of the material used is reinforced with ample ribs to withstand much greater stresses than would be encountered under maximum operating conditions.



The Crankshaft is of Chrome Nickel Steel, heat treated and perfectly balanced. It is supported by five main bearings and is bored hollow throughout. The main bearings are steel, babbitt lined,

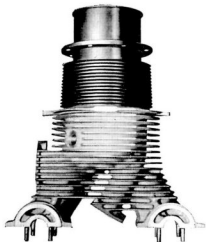


and the crankpin bearings are $2\frac{3}{8}$ " x $2\frac{3}{8}$ ". A single row ball bearing takes the propeller thrust in either direction.

The Connecting Rods are H section forged Duralumin, babbitt lined.



The Cylinders are machined from Chrome-Molybdenum steel forgings, heat treated, with ample fins for cooling. The cylinder heads are of a special heat-treated aluminum alloy and are screwed and shrunk on the cylinder barrels. Aluminum bronze valve seats are shrunk into the heads. The cylinders are held to the crankcase by four studs and four through bolts from the main bearings, thereby making a very strong self-contained unit. The bore is ground and honed to a very smooth finish.



From The Pilot's Standpoint

No place to put oil except in the oil tank!

No valve clearances to check and adjust!

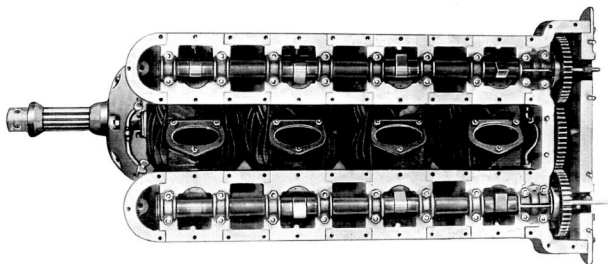
No cooling difficulties.

No rocker arms and push rods to oil and grease!

No hot exhaust gasses flying in your face—the exhaust down below where it belongs!

No cylinders to obstruct your vision!

Smoothness and exceptional freedom from vibration—the result of careful attention to balance and details of design!

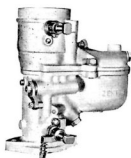
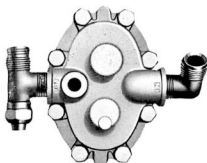


The simplified valve action of the Martin engine with oil tight cover removed—showing the unique design which does away with valve adjusting, and greasing and oiling of rocker arms and push rods—thus eliminating troubles and details for Pilots and Mechanics.

open into the valve housing. The camshaft bearing oil holes are timed to coincide with one of these oil ducts as soon as the valve closes and the other just before it opens, spraying clean, fresh oil against the valve stem. The oil then runs down the stem and back into the cam housing through holes in the lifter cups. The entire valve mechanism is in a constant bath of oil. **No adjustment is provided for as adjustment is unnecessary in the field.** Exhaustive tests have shown that wear on these vital parts is practically negligible.

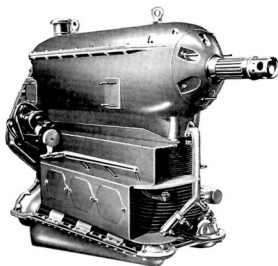
The Oil Pump is of the dual gear type and supplies oil to all bearings under pressure. Cylinder walls and piston pin bearings are lubricated by spray from the crankpin bearings.

Dual Ignition to each cylinder is supplied by two Scintilla Magnetos mounted on S.A.E. Standard flanges on the gear case.

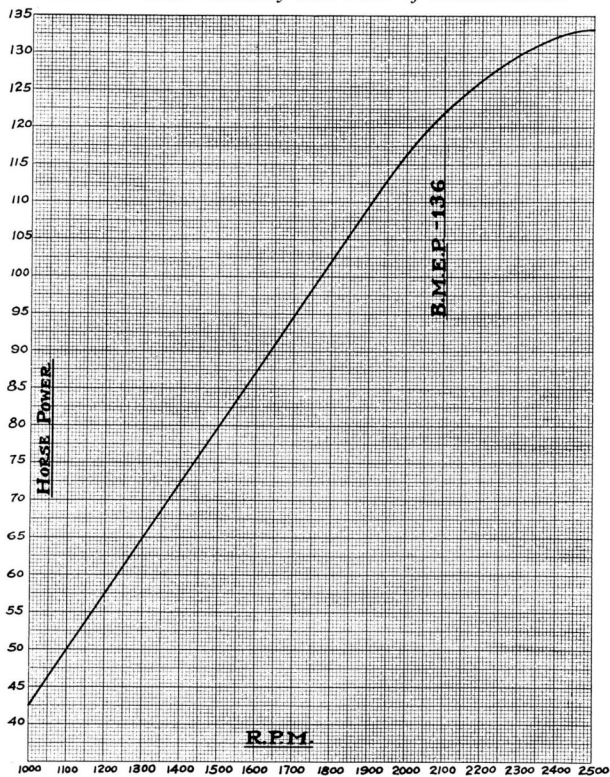


Carburetion is supplied by a Zenith down-draft carburetor with Altitude regulator. The down-draft carburetor is a distinct advantage from the standpoint of power with economy.

Efficient Cooling is obtained by the passage of air through a small scoop on one side of the cylinder heads. This scoop is furnished with the engine. On account of the special shape of the head, the cooling air coming through the scoop has no interference from exhaust stacks and strikes directly on the hottest spot of the head, keeping its temperature very low and uniform.



Power—with Economy and Ease of Maintenance

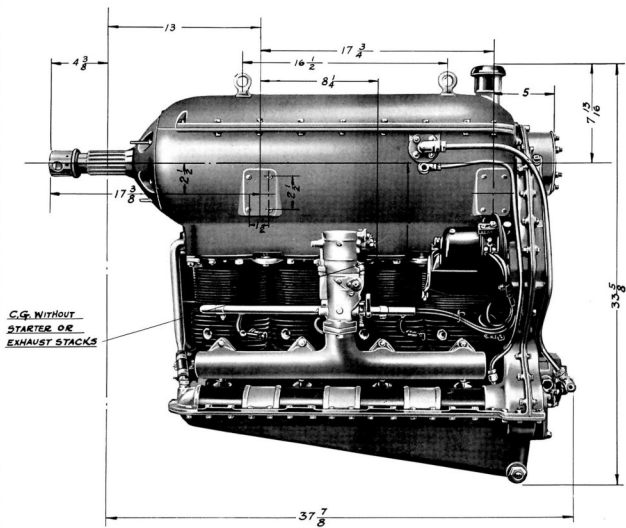


*Power Curve
Martin-333*

Installation Details

Side View

Martin-333



Installation Details

Front View

Martin-333

