

New Lycoming Engine Featured by Five Bearing Crankshaft

Long Connecting Rods and Light Reciprocating Parts Make for Smooth Operation. Force Feed Lubrication Used. Lynite or Cast Iron Pistons Optional

A STIFF five-bearing crankshaft and a system of forced feed lubrication, in which the pressure is controlled by the throttle, are among the more important features of the new Lycoming engine, known as the model C series and offered in 3½, 3¾ or 3⅞ in. bore and 5-in. stroke.

The engine can be had with either Lynite or cast iron pistons. The cylinder block, the upper half of the crankcase and the detachable cylinder head are all gray iron castings. The crankcase is stiffened by the webs which carry the main bearings. The flywheel housing is an integral part of this casting.

The flywheel is attached by means of six ½-in. bolts to a 6-in. flange forged integral with the crankshaft. All bearing surfaces are ground and the crankshaft is drilled for force feed lubrication to main and connecting rod lower bearings. The finished shaft is tested for dynamic balance. The crankshaft is carried in five main bearings.

Both types of pistons are fitted with

.003-.004 in. clearance at the first land. The Lynite pistons are of the split-skirt type. Three piston rings are used, all located above the piston pin. Two of the rings are ⅛ in. wide and the third is 3/16 in. The piston length is 4⅞ in. The piston pins are 1½ in. in diameter and 2 29/32 in. long. They are made of case-hardened steel, drilled hollow and ground.

Full floating piston pins are used in the Lynite pistons, endwise movement being prevented by snap rings in the piston pin bosses. The connecting rod is bronze bushed. When cast-iron pistons are used, the piston pin is clamped in the connecting rod, the bearing being in the bosses.

The connecting rods are of I-beam section. The length from the center of the piston pin bearing to the center of the crank pin bearing is 12 in. Bronze backed, babbitt-lined bearings, ground to size, are used in the big ends. The cap is held in place by two 7/16-in. nickel steel, heat-treated bolts. The main bearings are also bronze backed, babbitt

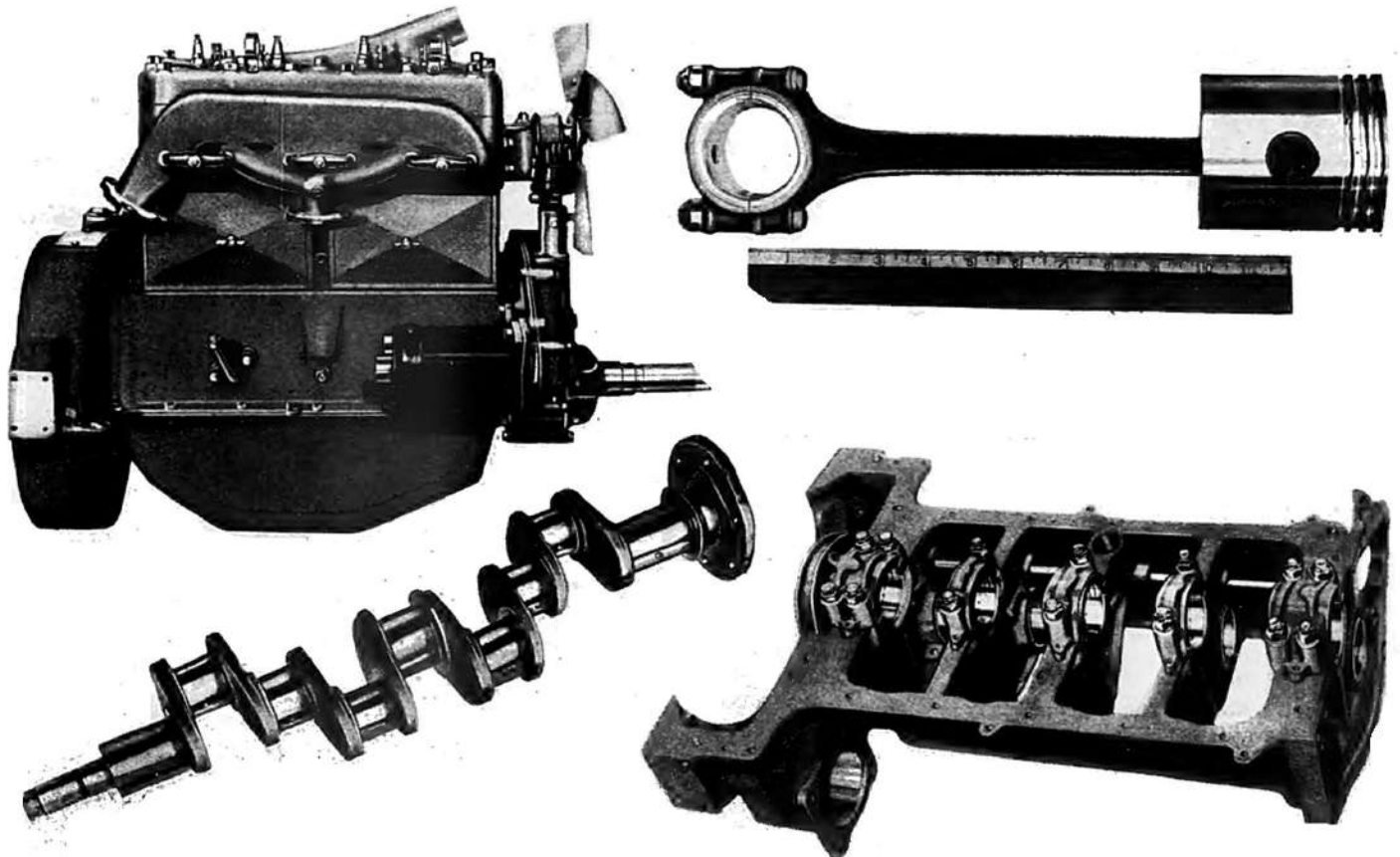
lined. No shims are used to fit the bearings. They are fly cut and line reamed to a clearance of .0015 in. to allow for the oil film.

The valves are interchangeable and have cast-iron heads electrically welded to steel stems. The valve lift is 11/32 in. and the effective working diameter is 1⅝ in.

The camshaft is carried in four removable bronze bushings. A spring-operated plunger bearing on a hardened steel button on the front end of the camshaft takes the end thrust and automatically adjusts for wear in the timing gears, which are helically cut. The crankshaft and generator gears are fiber and the camshaft gear is cast iron. Removal of the timing gear cover renders these gears easily accessible.

The flywheel is of semi-steel. It is machined all over and tested for dynamic balance. Teeth for the starting motor are cut in the periphery of the flywheel.

The intake and exhaust manifolds are an integral casting which is held in position by clamps. Proper alignment be-



Upper left, carburetor side of the Lycoming engine. It will be noted that the removal of the generator does not interfere with the ignition unit, which is mounted on the timing gear case cover. Light reciprocating parts are a feature of the engine, the connecting rod also, is very long, being 12 in. from center of crankpin bearing to piston pin. Below is the five-bearing crankshaft and the main bearing layout on the crankcase

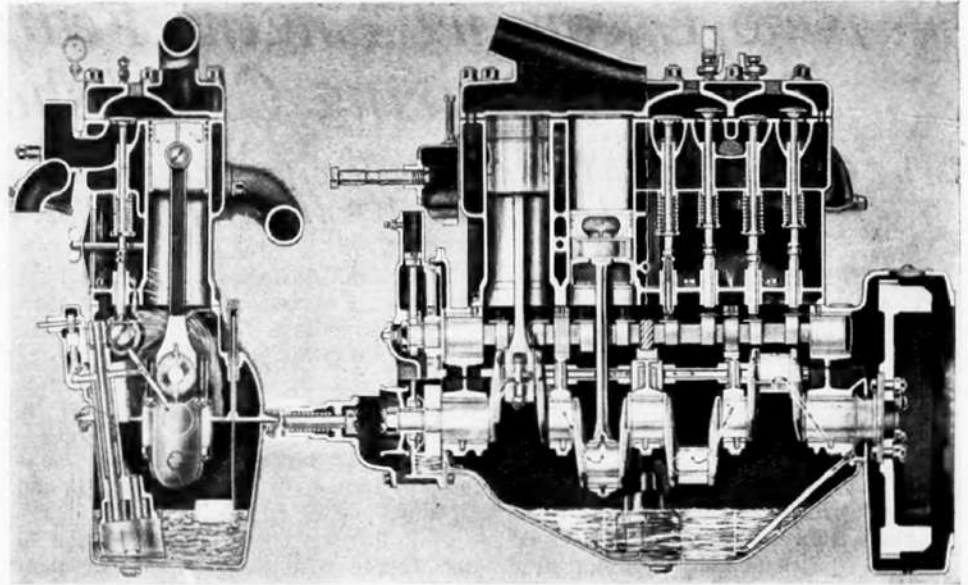
tween the intake manifold and the intake ports is secured by means of steel sleeves fitted into the intake ports. A hot spot is provided to assist in the vaporization of the fuel.

Cooling is by therm-syphon. The fan drive pulley is mounted on the front end of the crankshaft, and there is ample clearance for removing and replacing the fan belt. The belt is a 1¼-in. flat type. The fan is carried on an adjustable supporting bracket which is fastened to a pad on the front end of the cylinder block.

Provision is made for mounting the ignition unit at the front end of the gear case over the timing gears. It is driven off the camshaft gear by a spiral gear. The mounting is adapted to take any standard make of distributor. The rotation of the distributor is clockwise when looking down on it from above the engine.

Pressure lubrication is used. Oil is carried under pressure to all main, connecting rod big end and camshaft bearings. The entire circulating system is contained in the upper half of the crankcase.

The gear type of oil pump is driven at camshaft speed by spiral gears located at the center of the camshaft. It is supported by the upper half of the crankcase but extends down into the oil reservoir. This construction permits removal of the oil pan without interference with other parts of the lubrication system. The pump intake is always immersed in oil and requires no priming.



Sectional view of the Lycoming engine. Water surrounds each cylinder. The end view shows the passages for inlet and exhaust gases.

The pump discharges directly into a distributor tube cast into the upper half of the crankcase. This tube is connected by holes drilled through the webs to all camshaft and main bearings. A nozzle on the front end of the distributor tube directs a continuous stream of oil onto the timing gears. Valves, push rods, pistons and piston pins are lubricated by oil thrown off the crankshaft.

The oil pressure varies from 2 to 5 lbs. at idling speeds up to 25 lbs. at wide-open throttle. A pressure relief valve is provided which discharges into a by-

pass leading back to the oil reservoir. This relief valve is connected to the throttle control. In this way, the oil pressure is regulated to conform to the load on the engine. Maximum pressure is secured with wide-open throttle and minimum with closed throttle.

An oil strainer is provided at the pump inlet. The oil level indicator is operated by a cork float and is in plain view on the side of the engine. The combined oil filler and breather is constructed with suitable baffles to prevent the escape of oil.