

Rickenbacker Announces Its New "Vertical Eight"

F. W. Pettyjohn Company, Now Local Dealers, Tells of New Car

A new car with an eight-in-line engine has been added to the Rickenbacker line and is now in production. The new chassis, which will be known as the vertical eight, will supplement the six, which will continue to be the backbone of the line. Three body types, a sport touring, a coupe, and a sedan, will be supplied on the standard 121 1/2 inch wheel-base chassis. Four-wheel brakes, oil rectifier and air cleaner are included as standard equipment. Balloon tires are optional at extra cost.

Performance, as secured by a high ratio of engine torque to car weight, has been made one of the outstanding characteristics of the new car. With a bore and stroke of 3 1/4 inches and a compression ratio of 4.76 to 1, an output of 70 horsepower at 3000 r. p. m. is secured. This is one horsepower for each 3.83 cubic inch piston displacement, the total displacement being 268.56 cubic inches. An acceleration of from 5 to 25 miles per hour on high gear in 6 1/2 seconds is claimed.

Unusual Design Features

There are a number of unusual design features, particularly in the engine. Some of these bear the stamp of the Rickenbacker air experience, the radiating fins on the cast aluminum oil pan, cold air blast for oil cooling in summer and a dual or duplex carburetor.

Probably the most unusual engine feature is the complete separation of the camshaft from the crankshaft compartment. The camshaft is carried in a separate oil-tight compartment and is completely immersed in oil at all times. This is directly in contrast with the usual method of oiling the camshaft by the spray from the crankshaft and rod bearings.

Like other eight-in-line engines, the Rickenbacker is arranged as a central and an outside four. The division into two fours, however, is carried out further than in other types in that it is carbureted and ignited as two fours. The manifolding is separate to each four to prevent overlapping and designed so that the characteristics of each passage from carburetor to cylinder is the same, to provide uniform distribution.

The eight cylinders are cast in an L-shaped block. The heads are incorporated in a separate casting which is formed to provide turbulence of the gases in the combustion chamber to a degree desirable for absence of detonation. The combustion chambers are domed over the valves and taper down to a small clearance on the opposite sides. The form is the same as that used on the Rickenbacker six. For uniformity the chambers are machined. The spark plugs are over the inner sides of the intake valves. A large water space is incorporated in the head over the combustion chamber and surrounding the spark plugs.

As in the six, gray iron three-bearing pistons with adjustable wrist pin bushings are used. The adjustment is taken up by means of a clamp bolt in the upper end of the rod.

Nine bearings support the crankshaft. To further carry out the provisions for rigidity the block is stiffened by webs on bridges which act as the bearing supports. The oil pan also lends support as a structural member, the ribbed cast aluminum contributing to the stiffness of the assembly. The bearings are all flanged type which is probably unique for production of American cars regardless of price class. As in the six, two flywheels, one at each end of the crankshaft are employed.

The valves are driven through a Morse 1 1/2 inch silent chain. This is a triangular three-sprocket arrangement, the third sprocket taking care of the generator and water pump. The crankshaft sprocket has 20 teeth, the camshaft 4 and the generator 15. The camshaft is supported on light bearings, held in webs in the camshaft compartment. Oil is fed into this compartment by the oil relief system and splash, and overflows into the crankcase. Thus, besides the oil submerged camshaft the mushroom ends of the tappets are always immersed in oil and the valve stems are constantly under a spray of oil and therefore to a large extent air-cooled.

Covered With Aluminum

To render the valve system accessible the entire left side of the engine and extending from the crankcase to the cylinder head there is a large compartment covered by a cast aluminum plate. When this plate is removed the entire valve mechanism including the tappets, springs and camshaft are exposed and the entire blocks of tappet guides can be removed. If only simple tappet adjustments are necessary, smaller hand holes in the large plate covered by small plates can be quickly opened by turning six thumb screws. This permits the adjustment of the tappets without draining the oil from the camshaft compartment. Mushroom tappets of hollow section transmits the valve drive

through the conventional nut adjustment to the valve stems.

The valve stems are inclined at an angle of 3 degrees to axis of the cylinder. The valves are 1 1/2 inches nominal diameter with 3/8 inch diameter stems. The valves springs are 45 pounds for both inlet and exhaust and the tappet clearance is .008 inches. The valve tappets are carried in demountable blocks in the same manner as in the six. Each end block in the eight carries six tappets and the center block four. The center block also carries the ball bearing and the spiral level gear which drives the oil pump and the ignition distributor, these being at opposite ends of the vertical shaft which is located at the center, longitudinally.

The oiling system on the eight does not differ from that on the six with the exception on this new model there is a cast aluminum oil pan on the bottom of which are radiating fins for cooling the oil. Another method of cooling the oil is also introduced on this model by means of the incoming cold air on the way to the carburetor. This air blast air cooling is used only in summer when the conditions are such that the driver has the dash regulation in the summer position for admitting cold air to the carburetor. In the winter when the dash adjustment is such that hot air is taken into the carburetor the oil cooling device is not in operation since the air is taken through a different passage.

As indicated above, the driver may utilize either one or two air intake passages. This is effected by the use of a bifurcated casting with a two-way valve. One passage of the casting is jacketed for a short section of its length. It is through this jacket around the air intake tube that the hot cylinder oil passes and is cooled by contact with the cold walls. The other passages for use in cold weather pass from the air cleaner directly to the carburetor without contact with the oil jacket. The Rickenbacker air cleaner as employed on the six is also used on the eight.

The carburetor is a dual type Zenith, with fixed jets. It is supplied by a dual feed line from the gasoline tank to the vacuum system. This furnished a reserve supply of fuel without thought of the driver, and in case of a leak in one line gives him another. Two pipes lead from the tank, one terminating at a lower point in the tank to the other and constituting a 2 gallon reserve supply. A three-way valve controls the reserve.

New Form of Hotspot

The intake manifolding had been arranged to avoid difficulties attendant upon attempting to manifold the entire eight cylinder as a single engine. The manifolds are arranged as if for two independent fours in the crankshaft. In other words, just as there is an inside and outside on the crankshaft so is there an inside and outside four on the manifolding, both intake and exhaust. This dual intake manifold is so designed that the characteristics of each passage from the carburetor to the cylinder are the same. The intake is provided with a new form of hotspot in which the exhaust is bled into the hotspot chamber, but not bled out. In other words, a blind chamber is created into which the heat enters but from which there is no outlet except to back up. The theory advanced for this is that as hot gases will readily go into a compartment filled with cold air, the heat enters rapidly until the temperature of the chamber has increased to a degree fixed by the operating conditions of the engine. The air is then imprisoned there serving as a cushion to keep additional gasses out and maintained an equal temperature under all driving conditions.

Two exhaust pipes are fitted with independent manifolds for the inner and outer fours, thus eliminating back pressure in the exhaust line. The muffler is also a dual type although incased in a single housing, so that the right really exhausts as two fours.

Ignition also is by a dual arrangement provided by a Delco system that has been specially designed for this engine. There are dual contact points on the rotor of the breaker mechanism as well as a dual condenser and dual coils. The electrical lighting systems are American Bosch with U. S. L. storage battery of 166 ampere-hour capacity.

The vertical eight like the six is equipped with the Skinner oil rectifying system and is operated on the distillation principle.

As in the six engine, clutch and gearset are mounted on a unit powerplant with three-point suspension. There is a slight departure from the six in the method of supporting the front end. Instead of the annular bearing furnishing the third point in the three-point suspension as in the six, the new eight rests on a small flat surface at the center of a longer member. The ends of which are attached to the side members of the frame just behind the radiator. Between

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