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Engine Valve Timing



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Arrangement of valves:

The valve arrangements are generally classified as L-head, I-head, T-head and F-head according to the arrangements of the valves. In the L-head design, both the inlet and exhaust valves are on one side of the engine. Sometimes it is called the side valve engine and is operated by a single camshaft, whereas the T-head engine requires two camshafts, with valves arranged in block. The I-head engine is also known as *overhead valve engine*



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VALVE OPERATION AND RECONDITIONING

The valves of an internal combustion engine are meant to admit air or air-fuel mixture into the cylinder and finally to let the exhaust gases go out. Poppet type valves are used for this purpose.

Most engines are provided with one inlet and one exhaust valve for each cylinder.

These valves are usually of equal size, though sometimes the inlet valves are made larger in size than exhaust valves.



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The arrangement of the valves on the engine may be either over-head type or L-head type. In the over-head arrangement, the valve stem is surrounded by a removable guide and spring holds the valve against seat.



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VALVE TIMING DIAGRAM

A typical valve-timing diagram of a vertical engine designed to operate at 800 r.p.m. is shown in Figure. Few observations made are listed below:

1. Inlet valve begins to open shortly after the piston has reached the top dead centre. It continues to remain open till the piston has passed 30 degrees over the bottom (lower) dead centre. Total time through which the valve remains open.



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2. Both inlet and exhaust valves remain closed during the compression stroke and most of the time in the power stroke. In terms of crank angle, both, the valves remain closed for about 285 degrees.



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3. On the power stroke the exhaust valve begins to open between 30 and 45 degrees before bottom dead centre and it continues to open till the piston has passed over the top dead centre. Thus the exhaust valve remains open about 225 degrees or about $1/21$ Sec.