

*Automotive Engines 10th*

**Chapter 15 Lubrication System Operation and Diagnosis**

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

1. What causes a wedge-shaped film to form in the oil?
2. What is the purpose of a windage tray?
3. What is hydrodynamic lubrication?
4. How does the oil flow from the oil pump, through the filter and main engine bearings, to the valve train?
5. How does internal engine leakage affect oil pressure?

## Answer Key

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1. The shape of the bearings allows small amount of oil to be trapped and it is this oil that is rotated by the crankshaft around the bearing, creating a hydrodynamic wedge.  
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2. A windage tray is a shield between the crankshaft and the oil in the oil pan. The purpose of the windage tray is to prevent the oil from being thrown by the counterweight of the crankshaft., thereby reducing oil foaming, improving lubrication, and reducing horsepower loss.  
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3. Hydrodynamic lubrication is the high pressure of oil created by the hydrodynamic wedge that supports the crankshaft on a layer (thin film) of oil.  
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4. Oil from the oil pump first flows through the oil filter and then goes through a drilled hole that intersects with a drilled main oil gallery, or longitudinal header. This is a long hole drilled from the front of the block to the back. Oil from the lifters goes up the center of a hollow pushrod to lubricate the pushrod ends, the rocker arm pivot, and the valve stem tip.  
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5. Oil clearance between main and rod bearings represents a limited amount of leakage that the oil pump is normally able to handle and still maintain oil pressure. If the clearance is increased due to worn bearings, the capacity of the oil pump cannot keep up and the oil pressure drops.  
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