Chapter #9 Images
1. Spark occurs  
2. Combustion begins  
3. Continues rapidly  
4. And is completed
Crank throw

Rod journal

Crank
Input, gasoline 100%

Radiant loss = 1/10

Radiator loss 1/3 of input

Exhaust loss 1/3 of input

Output = approximately 1/4 of input
Atkinson Cycle timing keeps the intake valve open well into the compression stroke. This effectively reduces engine displacement, which minimizes fuel consumption.

Advancing intake valve timing closes the intake valve sooner. This effectively increases engine displacement and produces more power.
Intake
Compression
Power
Exhaust
- Reference mark, Engine speed
- Accelerator pedal position, Loading pressure
- Radiator and air temperature sensor
NOTE: VIN is stamped on the bedplate.

Label located on valve cover:

- Engine number
- Block foundry ID and date

5.0 2355 743
2235 1234 743 3 PLT
Late ignition timing  
Manifold leak  
Weak valve spring  
Leaking head gasket  
Carburetor or injector adjustment  
Burnt or leaking valves  
Sticking valves  
Restricted catalytic converter or muffler
1. Spark occurs
2. Combustion begins
3. Continues
4. Detonation
1. Ignited by hot deposit  
2. Regular ignition spark  
3. Flame fronts collide  
4. Ig Knites remaining fuel
# COMMON CYLINDER NUMBERING AND FIRING ORDER

## IN-LINE

<table>
<thead>
<tr>
<th>Cylinder</th>
<th>Firing Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Cylinder</td>
<td>1-3-4-2</td>
</tr>
<tr>
<td></td>
<td>1-2-4-3</td>
</tr>
<tr>
<td>6-Cylinder</td>
<td>1-5-3-6-2-4</td>
</tr>
<tr>
<td></td>
<td>1-2-4-3</td>
</tr>
</tbody>
</table>

## V CONFIGURATION

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Firing Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>V6</td>
<td>1-4-5-2-3-6</td>
</tr>
<tr>
<td>Right Bank</td>
<td>1-6-5-4-3-2</td>
</tr>
<tr>
<td>Left Bank</td>
<td>1-2-3-4-5-6</td>
</tr>
<tr>
<td>V8</td>
<td>1-5-4-2-6-3-7-8</td>
</tr>
<tr>
<td>Right Bank</td>
<td>1-8-4-3-6-5-7-2</td>
</tr>
<tr>
<td>Left Bank</td>
<td>1-2-3-4-5-6</td>
</tr>
<tr>
<td>V6</td>
<td>1-4-2-3-5-6</td>
</tr>
<tr>
<td>Right Bank</td>
<td>1-8-7-2-6-5-4-3</td>
</tr>
<tr>
<td>Left Bank</td>
<td>1-2-3-4-5-6</td>
</tr>
</tbody>
</table>