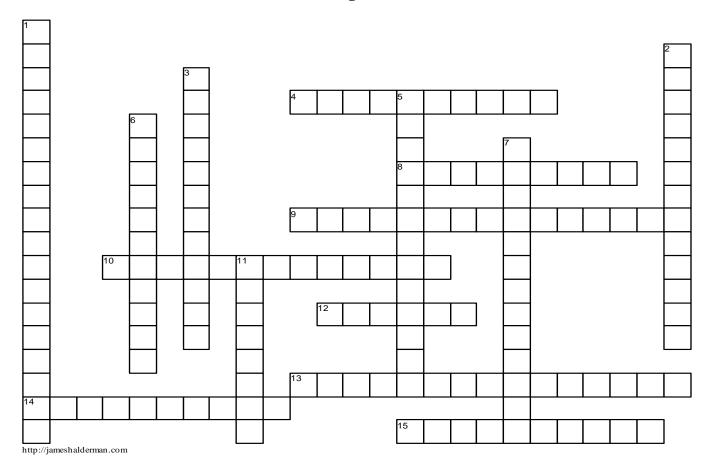
# Hybrid Engine Systems

## Chapter 4



#### **ACROSS**

### 4 Instead of using a piston along a helical spline, the \_ \_\_ uses a rotor with four vanes, which is connected to the end of the camshaft. 8 The \_\_\_\_\_ holes are usually not centered in the piston. 9 One of the best tests that can be used to determine engine condition is the \_\_\_\_\_ test involves injecting air under pressure into the cylinders one at a time. **10** The\_ \_\_ engine is an engine that uses a late closing intake valve to reduce compression pressures and an extended power stroke event. 12 To reduce side loads, some vehicle manufacturers \_\_\_\_\_ the crankshaft from center. 13 \_\_\_\_, using a hand operated pressure tester, is a quick and easy cooling system test. 14 The camshaft position actuator \_\_\_\_ valve (OCV) directs oil from the oil feed in the head to the appropriate camshaft position actuator oil passages 15 The \_\_\_\_\_ is a temperature-controlled valve

#### DOWN

| 1 | The engine (ICE) converts the                               |
|---|---|
|   | energy contained in the fuel into heat energy in a          |
|   | process called combustion.                                  |
| 2 | timing (VVT) involves the use of                            |
|   | electric and hydraulic actuators that are used to change    |
|   | the timing of the camshaft(s) in relation to the            |
|   | crankshaft. VVT, also called variable cam timing (VCT),     |
|   | allows the valves to be operated at different points in the |
|   | combustion cycle to improve performance.                    |
| 3 | shutters (AGS) are designed to remain closed to             |
|   | decrease the aerodynamic drag by forcing the air to flow    |
|   | underneath the vehicle when closed.                         |
| 5 | refer to the energy required to                             |
|   | overcome the restriction in the intake system to fill the   |
|   | cylinders with air during the intake stroke.                |
| 6 | An engine that uses VVT on theis                            |
|   | used to create an EGR affect, thereby eliminating the       |
|   | need for an EGR valve.                                      |
| 7 | The purpose of the engine is to                             |
|   | bring the ICE up to the optimum temperature as quickly      |
|   | as possible and maintain that temperature under all         |
|   | operating conditions.                                       |
| 1 | A can be used on many vehicles to read the                  |
|   | actual temperature of the coolant as detected by the        |
|   | engine coolant temperature (ECT) sensor.                    |



placed at the engine coolant outlet on most engines.