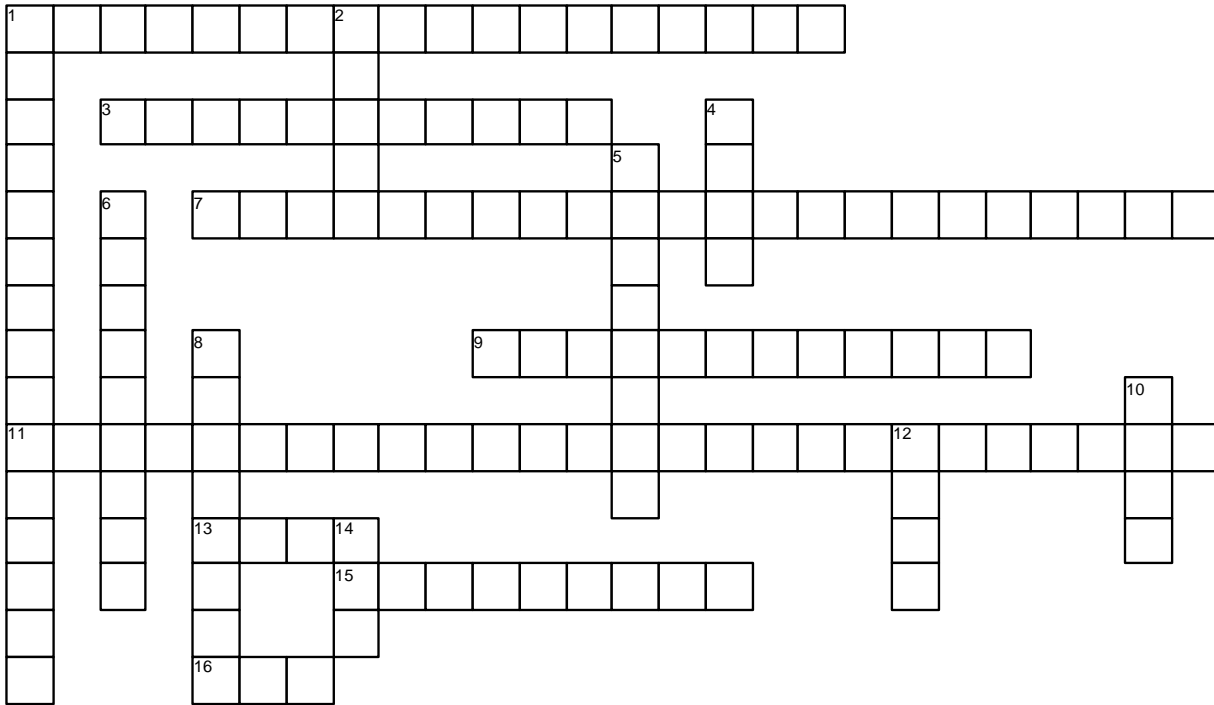


Engine Oil

Chapter 22



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ACROSS

- 1 Many oil filters are equipped with an _____ that prevents oil from draining out of the filter when the engine is shut off.
- 3 Either the engine or the filter is provided with a _____ that will allow the oil to go around the filter element.
- 7 _____ modifies the viscosity of the base fluid so that it changes less as the temperature rises.
- 9 _____ slow the breakdown of the base fluids caused by oxygen (air) and heat.
- 11 The _____, working with the engine manufacturers and oil companies, has established an engine oil performance classification.
- 13 The _____ rates the oil according to A1-A5 for gasoline engines.
- 15 The lowest temperature at which oil will pour is called its _____.
- 16 Engine oils are sold with a _____ grade number, which indicates the viscosity range into which the oil fits.

DOWN

- 1 An _____ is a number of chemicals that will help each other that can be used for each of the additive requirements.
- 2 The _____ developed an oil rating that consolidates the SAE viscosity rating and the API quality rating.
- 4 The levels of phosphate and zinc, commonly referred to as _____, have been reduced because they can cause damage to the catalytic converter.
- 5 Oils must also be _____, meaning they are capable of mixing with other oils without causing any problems such as sludge.
- 6 The term _____ means that it is a manufactured product and not refined from a naturally occurring substance.
- 8 _____ prevent acid formation (corrosion) in the form of sludges or varnishes.
- 10 ACEA oil has a high temperature/high shear rate viscosity, abbreviated _____.
- 12 ACEA oil requires low levels of sulfated ash, phosphorous and sulfur, abbreviated _____.
- 14 The _____ performance or service classification and the SAE grade marking are the only information available to help determine which oil is satisfactory for use in an engine.