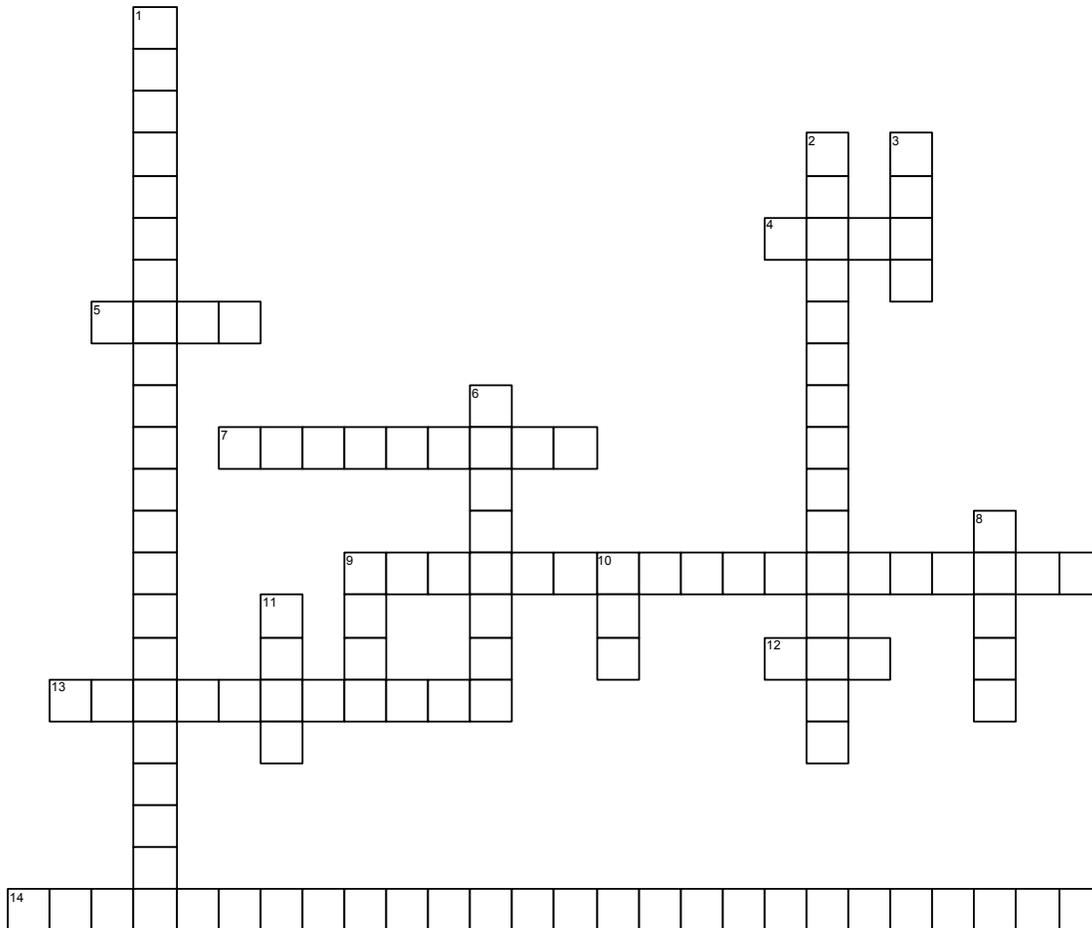


# Engine Oil

## Chapter 22



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### ACROSS

- 4 The levels of phosphate and zinc, commonly referred to as \_\_\_\_\_, have been reduced because they can cause damage to the catalytic converter.
- 5 ACEA oil has a high temperature/high shear rate viscosity, abbreviated \_\_\_\_\_.
- 7 The lowest temperature at which oil will pour is called its \_\_\_\_\_.
- 9 Many oil filters are equipped with an \_\_\_\_\_ that prevents oil from draining out of the filter when the engine is shut off.
- 12 Engine oils are sold with a \_\_\_\_\_ grade number, which indicates the viscosity range into which the oil fits.
- 13 Either the engine or the filter is provided with a \_\_\_\_\_ that

will allow the oil to go around the filter element.

- 14 The \_\_\_\_\_, working with the engine manufacturers and oil companies, has established an engine oil performance classification.

### DOWN

- 1 \_\_\_\_\_ modifies the viscosity of the base fluid so that it changes less as the temperature rises. □
- 2 An \_\_\_\_\_ is a number of chemicals that will help each other that can be used for each of the additive requirements.
- 3 ACEA oil requires low levels of sulfated ash, phosphorous and sulfur, abbreviated \_\_\_\_\_.

- 6 Oils must also be \_\_\_\_\_, meaning they are capable of mixing with other oils without causing any problems such as sludge.
- 8 The \_\_\_\_\_ developed an oil rating that consolidates the SAE viscosity rating and the API quality rating.
- 9 The \_\_\_\_\_ rates the oil according to A1-A5 for gasoline engines.
- 10 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.
- 11 The \_\_\_\_\_ tests use small Japanese engines, and their ratings require more stringent valve train wear standards than oil ratings in other countries.