

Name _____

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

1) What is the difference between gray cast iron and compacted graphite iron (CGI)?

2) Why should crankshafts be stored vertically?

3) What is the difference between Nitriding and Tuftriding?

4) What is the difference between a girdle and a bedplate?

5) How is surface finish measured?

6) Where is the block heater located?

Answer Key

Testname: LVDE1_SHORT2

1) Gray cast iron contains about 3% carbon (graphite), which makes it gray in color. Compacted graphite iron (CGI) has increased strength, ductility, toughness, and stiffness compared to gray iron. With the addition of even small amounts of magnesium, an excess of the sulfur and oxygen form in the molten solution, resulting in the shape of the graphite changing to compacted graphite forms.

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2) All crankshafts should be coated with oil to keep them from rusting, and stored vertically until time for engine assembly to help prevent warping due to gravity.

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3) Nitriding is a process where the crankshaft is heated to about 1,000°F (540°C) in a furnace filled with ammonia gas, and then allowed to cool. Nitriding adds nitrogen (from the ammonia) into the surface of the metal, forming hard nitrides in the surface of the crankshaft to a depth of about 0.007 inch (0.8 mm). Tuftriding is a hardening procedure that involves heating the crankshaft in a molten cyanide salt bath. Tuftriding is a trade name of General Motors.

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4) A girdle uses a solid steel support that attaches to the main bearing caps and ties the entire lower part of the block together. A bedplate, also called a frame-ladder design, is a structural member that attaches to the bottom of the block and supports the crankshaft.

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5) Surface finish is measured in micro-inches, and the smaller the number is, the smoother the surface. The typical specification for main and rod crankshaft journals is between 10 and 20 roughness average (Ra). This very smooth surface finish is achieved by polishing the crank journals after the grinding operation.

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6) A block heater is normally installed in one of the core (freeze) plugs where an electrical current from a 110-volt electrical outlet is used to heat the coolant in the block.

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