

Most of the car owners engineering essay

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Introduction Most of the car owners have seen themselves in the dilemma of selecting which motor oil to buy for the best performance of their car. This theme has been concerning us since decades ago as it is fundamental for your car's performance; car owners see themselves deciding between different motor oil which are categorized in a way that most might not understand (mainly divide in monograde and multigrade oil) . Choosing the best motor oil is much more complex than the idea of the " good one and the bad one", it in fact involves viscosity and some chemical properties. This dilemma is caused by lack of knowledge of the effects that the surroundings (temperature) have on it, or how your car works. This theme is really important as it's crucial to know how motor oil works, the variety there are, and mainly how it is affected by temperature in order to know which is adequate for your car. Objectives: The main objective of this extended essay is to effectively analyze and clearly describe the effect of temperature on motor oil viscosity through a simple experiment, finding trends and patterns from the data gotten from it. A secondary objective is to describe the different types of oils and how are they classify, and additionally analyze the implications of the climate on the motor oil selected for your car. What is oil? Oil is an abundant substance of the earth that comes from different sources of nature. Oils are used for different purposes; into its characteristic, it is a viscous liquid which varies in thickness depending on the type of oil. At atomic levels, oils are made of triglycerides which are esters; the main components of oil are hydrocarbons. In the wide amount of properties of oils we can highlight that oils don't mix with water, most oils boiling point are greater than water which evidently means than it can be heat at higher temperatures, a good example is cooking oil. Most oils are flammable and <https://assignbuster.com/most-of-the-car-owners-engineering-essay/>

those will just burn in the presence of oxygen. There are two kinds of oils, mineral and organic oil. Organic oil is created by organic means such as plants, animals, fungi and other living organisms. Mineral oils come from absorbent rocks, these oils are really ancient and were originally created by biological means but are at the moment being produced by the leftovers of these, an example is petroleum. These oils have different functions, some mineral oils are used as bath oils, and some others as fuel for modes of transportation. On the other hand some organic oils are used for cooking, some others are used as health supplements, and some others are used as lubricants or paints. Motor oil is gotten from the raw petroleum where you can find other compounds like all kinds of fuels, minerals, oils, tars and other extra compounds mixed together. Motor oil is purified by the process of hydro cracking where oil is heated up and using a mixture of pressure and hydrogen and catalysts to break apart the waxes into mineral oils. Usually some additives are added to the purified oil in order to help the oil flow more without restraint, freeze less easily and to burn at higher temperatures. How Is Motor Oil Made? | eHow.com http://www.ehow.com/about_6331415_motor-oil-made_.html#ixzz2Im0cQtAW

http://www.ehow.com/about_4602166_what-is-oil.html Role of oil in an engine The main functions of oil in an engine are basically three; to lubricate, to clean, and to cool. The oil must lubricate engine components so that they will easily pass by one another without any significant loss of power due to friction. Each different type of engine requires a certain viscosity range in order that the oil will provide an adequate layer between moving parts while still flowing quickly and easily enough throughout the engine. The oil must clean as an engine doesn't remain efficient if it's not clean. The Oil must cool, in fact is <https://assignbuster.com/most-of-the-car-owners-engineering-essay/>

responsible for a high amount of cooling that must be done in the engine. The radiator (anti-freeze system) is only responsible for cooling the upper portion of your engine. The rest (crankshaft, camshaft, timing gears, pistons, main and connecting rod bearings and many other critical engine components are cooled mainly by the motor oil within your engine. radiator (anti-freeze system) is only responsible for cooling the upper portion of your engine. The rest (crankshaft, camshaft, timing gears, pistons, main and connecting rod bearings and many other critical engine components are cooled mainly by the motor oil within your engine. Motor oil at different temperatures When oil experiences a change in temperature some of its physical properties can change such as viscosity. Informally, viscosity is the quantity that describes a fluid's resistance to flow, is a physical property of fluids that reflects the tendency to flow, in order words is a measure of a liquid's ability to flow. Oil thins when heated and thickens when cooled. In general, the viscosity of a simple liquid decreases with increasing temperature (and vice versa). Chemically speaking, as temperature increases, the average speed of the molecules in a liquid increases and the amount of time they spend " in contact" with their nearest " neighbors" decreases. Thus, as temperature increases, the average intermolecular forces decrease. Engine oil flows best (it has optimal viscosity) within temperature ranges of zero and 200 degrees Fahrenheit. For this reason, oil brand products are rated with regards to how well they perform within these temperature limits. Beyond these parameters, many oils begin to either clump up, to coagulate in the cold or burn up from heat were oil minerals are broken down. The effect at either end of the temperature spectrum is a loss of lubrication in the engine. This, in turn, creates friction and heat, which

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ultimately damage and ruin exposed engine parts. In the motor oil market we can find two types of oils; monograde and multigrade oil. In a monograde oil the motor oil viscosity is defined at only one temperature, either high or low. The multigrade oil in difference to the monograde it can maintain a viscosity that will protect the engine effectively at either high or low temperature. This is why choosing the proper motor oil viscosity grade for the ambient temperature of your geographic location is vitally important. SAE oil classification due to difficulties with selecting the right oil for your engine the society of automotive engineers (SAE) designed a system that was showing the appropriateness of an oil as a engine lubricant. In fact, in 1911 the SAE published the first oil standards which defined the different grades of motor oil, reflecting the flow rate. SAE tries to divide to categories, high and low viscosity oils, this is because in either both extremes oil doesn't lubricate properly, when oil have low viscosity its thin and the oil pump cannot keep enough pressure to maintain the oil circulating properly; in the case of the high viscosity oil its too thick and that doesn't let it penetrate between the small working parts of the engine. Nowadays the most prominent oil ratings are still the SAE viscosity rating. Low viscosity oil will have a SAE rating of 0W, 5W, 10W, 15W and 20W; and they are supposed to flow better at lower temperature. On the other hand, high viscosity oils have ratings of 10, 20, 30, 40, 50 and 60 and they are supposed to flow better at higher temperatures. The " W"/" WINTER" signifies that the oil is suitable for cold temperatures because it remain thin even during low temperatures. In most of the selling oil bottles we can find a SAE label like this " 10W-30". In the case of the winter grade oils, the number next to them represents the amount of temperature needed to successfully work, for example, 5W is

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suitable for use in temperatures as low as -25 degrees Celsius, 10W for temperatures as low as -20 degrees Celsius, 15W for -15 degrees Celsius and 20W for -10 degrees Celsius. A 0W oil was recently developed and is used primarily in workshops and in some extremely cold places. The second number indicates how the oil will perform in very hot temperatures---the goal is to keep the oil from getting too thin because thicker oil performs better in heat. Oil that is graded 5W-60 is the most versatile oil that is widely available. It would be vital to check the manual of the certain car oil is being put to make sure that the adequate viscosity ratings of the oil are used .

Modern car engines are designed to run at specific temperature ranges and for proper lubrication they require oils rated for their operating temperatures. Equipment: Three beakers Three thermometers Multigrade oil Pair of pincers One glass marble Stopwatch Stove Ice water bath Variables: viscosity Temperature, Time, mass Experiment procedure: Pour some multigrade oil into the adequate beaker. Take a thermometer and place into the beaker. Keep a record of the temperature measurement. Using a pair of pincers pick up the glass marble. Hold the stopwatch. Drop the glass marble into the beaker and start the stopwatch at the same time. Stop the stopwatch as soon as the marble touches the bottom of the beaker. Repeat this process times to calculate the average time that the marble takes to reach the bottom of the beaker. Take the second beaker and repeat Step 2 with the same amount of oil but in this case, the oil must be heated to a higher temperature, using the stove. Tabulate the amount of time that the glass marble takes to reach the bottom of the beaker. (The marble should take less time to reach the bottom as the temperature of the oil increases, indicating a decrease in viscosity.) Take the third Pyrex beaker and repeat

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step 2 with the same amount of oil but before dropping the marble glass the oil must be cooled through an ice water bath. Tabulate the time that the glass marble takes to reach the bottom of the beaker. In this case, the marble should take more time, indicating an increase in viscosity with lower temperature. Cda 10 C de x a y CELCIUS ? 5 trials Previous trial to define is the glass marble curves Beakears 500 ml ?*need to decide some numbers(temp, amount oil, which oil? ERROR ANALOG CLOCK MINIMIZE ERROS 5 TRIALS WHICH OBJECTS TO USE TO THROW(BILLA)(GETS BIGGER WHEN TEMP IS HIGH, AND GETS SMALLER WHEN TEMP IN LOW) CARFULL TO TAKE THE GLASS MARBLE IN ORDER TO DON'T TAKE OIL MASS CHECK MASS EVERY TRIAL TRAER CAMARAMETODO INDIRECTO DE HAYA VISCOSITY(COEFICIENTE DE VISCOSIDAD DIRECTA)