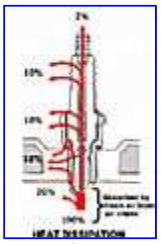




Heat ranges are not the same between brands



How heat is dissipated

Heat range

The term spark plug heat range refers to the speed with which the plug can transfer heat from the combustion chamber to the engine head. Whether the plug is to be installed in a boat, lawnmower or racecar, it has been found the optimum combustion chamber temperature for gasoline engines is between 500°C–850°C. When it is within that range it is cool enough to avoid pre-ignition and plug tip overheating (which can cause engine damage), while still hot enough to burn off combustion deposits which cause fouling.

The spark plug can help maintain the optimum combustion chamber temperature. The primary method used to do this is by altering the internal length of the core nose, in addition, the alloy compositions in the electrodes can be changed. This means you may not be able to visually tell a difference between heat ranges. When a spark plug is referred to as a "cold plug", it is one that transfers heat rapidly from the firing tip into the engine head, which keeps the firing tip cooler. A "hot plug" has a much slower rate of heat transfer, which keeps the firing tip hotter.

An unaltered engine will run within the optimum operating range straight from the manufacturer, but if you make modifications such as a turbo, supercharger, increase compression, timing changes, use of alternate fuels, or sustained use of nitrous oxide, these can alter the plug tip temperature and may necessitate a colder plug. A rule of thumb is, **one heat range colder per modification** or one heat range colder for every 75–100hp you increase. In identical spark plug types, the difference from one full heat range to the next is the ability to remove 70°C to 100°C from the combustion chamber.

The heat range numbers used by spark plug manufacturers are not universal, by that we mean, a 10 heat range in Champion is not the same as a 10 heat range in NGK nor the same in Autolite. Some manufacturers numbering systems are opposite the other, for ***some manufacturers*** (Champion, Autolite, Splitfire and Bosch), ***the higher the number, the hotter the plug. For othe manufacturers*** (NGK and Denso), ***the higher the number, the colder the plug***.

Do not make spark plug changes at the same time as another engine modification such as injection, carburetion or timing changes as in the event of poor results, it can lead to misleading and inaccurate conclusions (an exception would be when the alternate plugs came as part of a single pre-calibrated upgrade kit). ***When making spark plug heat range changes, it is better to err on the side of too cold a plug***. The worst thing that can happen from too cold a plug is a fouled spark plug, ***too hot a spark plug can cause severe engine damage***

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