Spark Plugs

General

The spark plugs bring the ignition current into the combustion chamber. The current flows through the insulated body to the electrodes in the combustion mixture where the current spans an air gap in the form of the ignition spark.

Construction

The basic parts of a spark plug are:

Center electrode

Insulator

Spark plug body.

The center electrode conducts the high voltage current through the insulator to the combustion chamber. The upper end is usually steel and is threaded to carry the ignition cable contact. A shoulder below the top threads seats against the insulator. Below the shoulder a set of threads holds the electrode in the ceramic. The end of the electrode which enters the combustion chamber is made of a special alloy section bonded to the upper shaft of the electrode. This alloy tip is designed to operate under high temperatures and is corrosion resistant. The metal is not easily affected by the lead content of the fuel or the sulphur compounds of the burned gases.

The insulator is made of a high grade ceramic material which retains its good insulating qualities even at high temperatures. The ceramic is very hard and is a good thermal conductor. For these reasons a spark plug of the correct heat range will not foul or oil up, nor will it pre-ignite the mixture by glow ignition. The thermal coefficient of expansion of the ceramic is very close to that of steel and can therefore operate through a large temperature range. Small differences in expansion are absorbed by the bonding cement in the spark plug base. The upper portion of the insulator is glazed to protect the ceramic from moisture and dirt.

The spark plug base contains the ceramic insulator, holds the spark plug in the cylinder head, and has the side electrode attached to its lower rim. The insulator is secured with spacers and washers by crimping the upper rim of the housing under high pressure. The side electrode is made of a special alloy and is attached to the rim of the housing by welding or by being forced into a bore in the side of the bottom edge.

Function

The high voltage current flows through the center electrode into the combustion chamber where it spans the air gap to the side electrode in the form of a spark. The resulting spark ignites the combustible mixture.

Service

Spark plugs should be checked every 3000 mi. (5000 km) for appearance, spark gap, and proper operation. The appearance indicates whether they are of the correct heat range, whether the engine is using too much oil, and whether the carburetors are correctly adjusted. The color of the spark plug insulator around the electrode indicates the following:

Light Brown

correct carburetor adjustment, heat range, and combustion.

Black

mixture too rich, spark plug too cold.

Light Grey

mixture too lean, spark plug too hot.

Oil coated

excess oil in cylinder, bad piston rings or worn intake valve guides.