

APPLICATION NOTE

AN INSTRUMENTED SPARK PLUG FOR IN-CYLINDER OPTICAL FIBER THERMOMETER MEASUREMENT

An instrumented spark plug has been developed to provide simple installation of Optical Fiber Thermometers (OFT) in automotive engine cylinders. The general arrangement of the spark plug is shown in Figure 1. Standard spark plug threads and lengths for U.S. and foreign automobiles are available. An adjustment nut is included to provide one-half inch of adjustment from the electrode of the spark plug into the cylinder. Standard Accufiber engine sensors are used with the instrumented spark plug. The spark plug has a mid-range heating value of six.

Since the OFT generates an optical signal, the possibility of scattered optical light from the spark was of concern during the initial development of the spark plug. Experimentally, this problem has not been observed. Typical data recorded in a single cylinder test engine are shown in Figure 2.⁽¹⁾ No evidence of scattered light from the spark is observed at ignition.

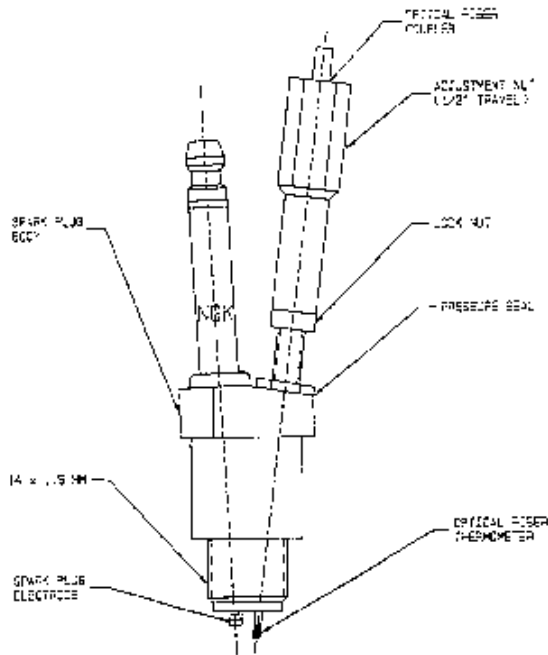


Figure 1. Instrumented Spark Plug

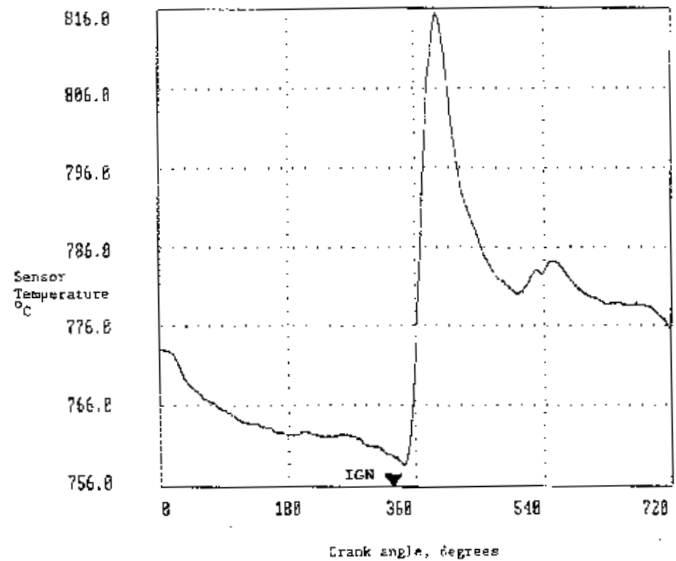


Figure 2. Typical Sensor Temperature Waveform from an OFT Located in an Instrumented Spark Plug. No Evidence of Scattered Light Due to Ignition at -30° BTDC is Observed in the Sensor Signal.

Optical fiber thermometer measurements in automotive engines are quite new and many alternate installation techniques are now being developed both at Accufiber and by our customers.⁽²⁾ Please contact the Accufiber factory to discuss your specific engine installation requirements.

1. Courtesy of Japanese Automotive Research Institute (JARI), August 1988.
2. Accufiber Application Note EAS100-02, "Installation of Optical Fiber Thermometers for In-cylinder Measurements".



