

NEW TECHNOLOGY SPARKS SMOOTHER ENGINES AND CLEANER AIR

Automotive Resources, Inc. (ARI), of Sandpoint, Idaho, has developed a new device for igniting fuel in engines—the SmartPlug.™ With assistance from **Small Business Innovation Research (SBIR)** funding and NASA's John H. Glenn Research Center, Mark Cherry, inventor of the SmartPlug, has revolutionized the traditional spark plug.

SmartPlug is a self-contained ignition system that may be retrofitted to existing spark-ignition and compression-ignition engines. The technology behind the SmartPlug is a pre-chamber containing a catalytic heating element, where ignition starts. A small amount of fuel-air mixture enters the area, where it is ignited by a tiny, heated wire or glow plug. This process is very similar to that of a diesel cycle. However, unlike the diesel cycle, the SmartPlug does not require heavy compression for its glow plug to set off combustion. The SmartPlug needs as little as six watts of power for warm-up, and requires no electricity at all when the engine is running. Unlike traditional spark plugs, once the SmartPlug ignites the engine, and the engine heats up, the power supply for the plug is no longer necessary. The SmartPlug becomes self-sustaining.

SmartPlugs can be used in a variety of industries. For example, in the utility industry they can be used in tractors, portable generators, compressors, and pumps. In addition to general-purpose applications, such as lawn mowers and chainsaws, SmartPlugs can also be used in the recreational, marine, aviation, and automotive industries.

Advantages of the SmartPlug ignition system are numerous. Unlike traditional ignition systems the SmartPlug system requires no distributor, coil points, or moving parts. This

revolutionary system, which has the ability to ignite a variety of fuels, requires no modification to the existing engine. SmartPlugs are non-fouling, with a faster and cleaner burn than traditional spark plugs. They prevent detonation and are not sensitive to moisture, allowing them to be used on a variety of engines. Other advantages include no electrical noise, no high voltage, exceptionally high altitude capabilities, and better cold-start statistics than those of standard spark ignition systems.

Dr. Forrest Bird, famed aviator/inventor from Idaho, volunteered to test-run the SmartPlug in his custom-built J-3 aircraft. Dr. Bird reported an increase of 200 rpm throughout the flight and a noticeable increase in engine smoothness. Tests done by ARI in collaboration with NASA's Glenn Research Center have yielded similar results, with the SmartPlug producing equivalent-to-stock horsepower and other benefits. What does this mean for the aviation industry? For one, it means smoother, more efficiently run aircraft and cleaner emissions. And because SmartPlug can operate using a variety of fuels, a more cost-effective means of air travel is also possible.

Future applications for the SmartPlug are being evaluated by manufacturers in the snowmobile industry for use in reducing air pollution in areas such as Yellowstone National Park. The Environmental Protection Agency (EPA) is interested in the SmartPlug technology because it greatly reduces emissions by enabling an engine to run on an alcohol and water mixture, instead of an oil and gas mixture. The EPA has given the snowmobile manufacturers until 2005 to reduce emissions produced by their machines. Mr. Cherry's SmartPlug technology has the ability to produce cleaner, smoother-running engines, which in turn will support the ongoing efforts for cleaner air. ❖

SmartPlug™ is a trademark of Automotive Resources, Inc.



Automotive Resources' SmartPlug™ technology uses a needle-like ceramic and metal core to deliver fuel ignition without a spark. Once the SmartPlug ignites the engine, the power supply for the plug is no longer necessary, and the SmartPlug becomes self-sustaining.