

Antenna Base Manufacturer Gets the Signal to Switch to Zinc

Since 1988 the Paige Electric Company assembles approximately half-a-million complete antenna bases a year for a major manufacturer of mobile radio equipment. The base is a two-piece (bushing and nut) assembly for roof or body-panel mounting of vehicle antennas.

The antenna base is installed by feeding a cable and bushing through a hole in the body panels and threading a nut onto the bushing from the outside. A gasket fits into a groove on the bottom surface of the nut and seals the antenna base to the roof. The antenna itself screws onto the OD thread of the nut.

When the OEM instituted a quality improvement program it strongly encouraged suppliers to reduce costs and improve component quality. With existing high quality a given, Paige looked for cost reductions to satisfy customer requirements. The cable cost was already low. The next largest cost

increment was the base, a brass screw-machined part.

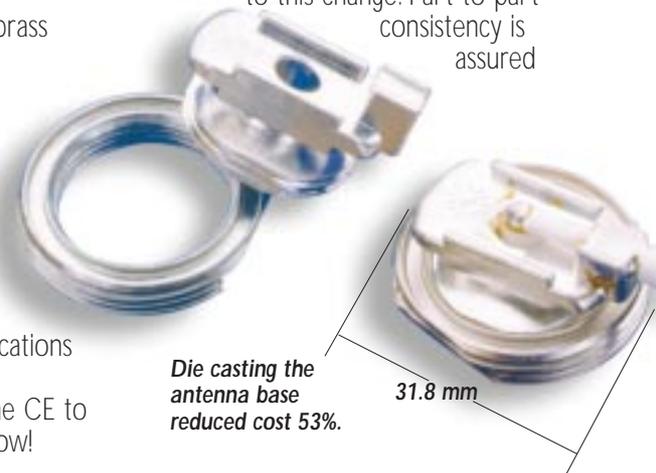
Powder metallurgy was evaluated, but couldn't produce the needed undercuts without machining. Paige's chief engineer discussed product improvement with a zinc die casting applications engineer. The end result of this meeting led the CE to enthusiastically exclaim, "Wow! A match made in heaven!"

Zamak 2 alloy was specified to provide the required strength, corrosion resistance and processibility. Thermal conductivity, a typical zinc physical property, was also important to dissipate heat from some of the fairly high-wattage radio systems.

Prototypes were made from the screw machine drawings using soft resin-type patterns. Slight modifications to the final tooling made the zinc alloy bushing even stronger than the brass components.

Paige's recommendation to die cast the nut as well as the bushing doubled the savings of the whole assembly. Die casting the antenna base reduced costs 53% over the brass alternative.

In addition, die casting eliminated a separate soldering terminal by making it an integral part of the bushing. This reduced the part count, eliminated an inventory handling step and a swaging operation, and avoided potential quality problems. A 40% reduction in assembly time is directly related to this change. Part-to-part consistency is assured



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because the components are produced from the same single-part tool. Tooling payback was estimated at three to four months.

Careful control of the center hole in the bushing provides a consistent press fit for the insulator, without further operations. The brass part required an extra reaming operation. The consistency of the die-cast parts allowed Paige to automate some of the component handling during assembly for further cost reductions.

Dynacast Inc., Elgin, IL, produces the zinc antenna bases for Paige Electric.



The original antenna bases were brass screw machinings.