

WINNER

Aristo-Cast Inc.'s Cylinder Puller Assembly Combines Complexity, Weight Reduction for Automotive Application

Production of several complex parts, reducing weight by more than half, and casting threads with no machining are among the benefits achieved by the investment casting of this cylinder puller assembly produced by Aristo-Cast, Inc., Almont, MI.

The cylinder puller assembly, cast in 4140 low alloy steel, is used to remove the steel cylinder liner from a diesel truck engine. The original liner is sweat or pressed into the engine block. Eventually, the cylinder becomes worn to the point that it must be re-

moved and replaced without damaging the block.

In use, the assembly consists of six castings and a double acme threaded rod. The original design of the hand-held and operated assembly weighed in at 30.88 pounds. The redesigned and investment cast version weighs 13.91 pounds, a savings of 16.97 pounds.

Aristo-Cast was contacted by the customer to assist their engineers and designers to remove as much weight as possible without sacrificing strength or function. Aristo-



Cast was faced with reducing weight without any functional design change while retaining strength and casting feasibility. All these requirements had to be met without any machining by the customer.

The design of the new parts were approved by the customer for function and strength, but the major difficulty was to cast the double acme thread to properly gage without an machining. Sixteen threaded core configurations were built with varied length,

diameters, pitch, plus varied shrink factors. Castings were made and inspected until the proper size was attained. At that point, cores were made from steel, heat treated and polished. The two parts that required threads, due to their different cast configurations, required different core pin sizes to attain proper size. Formerly manufactured from bar stock, this application exemplifies the ability of the investment casting process to adapt and produce castings to almost any design or configuration.