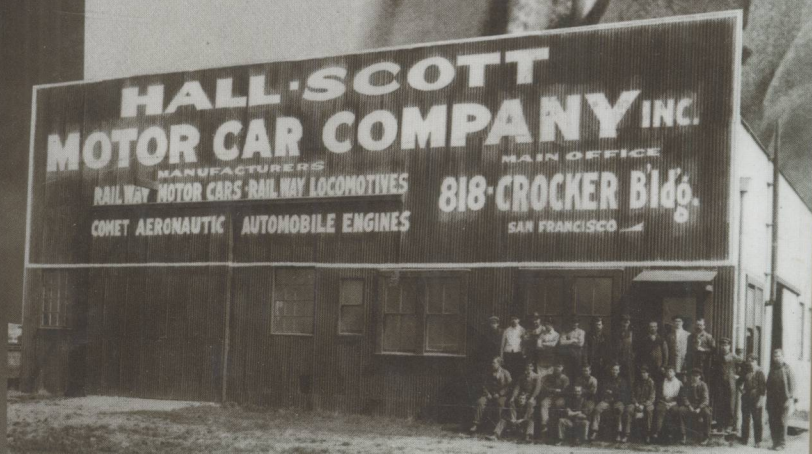


Hall-Scott: The Untold Story of a Great American Engine Maker

Francis H. Bradford and Ric A. Dias

Hall Scott
-MOTOR CAR CO.

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*The Untold Story of a
Great American Engine Maker*

Francis H. Bradford

and

Ric A. Dias



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400 Commonwealth Drive
Warrendale, PA 15096-0001 USA
E-mail: CustomerService@sae.org
Tel: 877-606-7323 (inside USA and Canada)
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Some contributors have personal connections to the Hall-Scott story and have shared invaluable family possessions with us. Taylor Scott opened his personal collection and that of his family (Taylor's great-grandfather, Leland, was secretary at Hall-Scott and was Bert Scott's brother), in which he has invested a great amount of time and money in compiling. William Nelson was the last Hall-Scott president, and his grandson, who shares his name, provided us with excerpts of his grandfather's autobiography and access to company records and Hall-Scott ads. Deb Brill wrote a thorough book on her family's company and then assisted in locating relevant materials. Bruce Balough has family connections to the Hercules Engine Company, and he assisted this project by providing a company history and Canton-area resources. Joe Bradford, Brad's son, dug for data in the Berkeley area and served as contact person between his father and me.

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Northern State University (NSU) made it possible for me to contribute my part in this project. NSU library staff, especially Jackie Hansen and Carolyn Blanchard, cheerfully and promptly filled the innumerable requests I made for technical help or to locate books, newspaper microfilms, journal article reprints, and other arcane and obscure bits. Plus, they isolated essential items that, without their particular skills and tenacious efforts, would never have been found. NSU covered the costs associated with photocopying, printing, electronic scanning, postage, telephone calls, and research trips, and gave me a one-semester sabbatical from teaching. Tara Coulthard, Ann Eisenbiesz, Karen Elliot, Chance Glasford, Linda Gray, Brian Harding, Jeanie Hoffman, Tania Stulc, Jim Rappe, Mandy Reid, Bobbi Jo Rissmann, John Romeo, Russell Vincent, and College of Arts and Sciences deans Jay Ruud, Dan Tallman, and David Grettler all played a much-appreciated part in this project. Note that Chance Glasford and Mandy Reid scanned more than 500 Hall-Scott images to aid this project.

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Assisting Brad with his 1989 history of Hall-Scott, which is the first full-length treatment of the company, were John E. "Speed" Glidewell, Alma Searing, John Tucker, John Webb, and Claire Wikander, all former Hall-Scott employees like Brad, Jay Eitel, Tom Sharpsteen, Richard Strad, Bill West (whose name has appeared at several points in this section and could not have been a stronger supporter), Philip D. Edmund of the Smithsonian Institution, and Roy T. Budmiger of Oslo, Norway.

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Brad was among the last Hall-Scott employees left in Berkeley in 1958 when the company closed the plant, and he helped with the shutdown. He saved hundreds of photos, letters, brochures, plans, and other items from being sent to the landfill. This material served as the basis for his unpublished 1989 Hall-Scott history work, which was the starting point for this book. His tenacious commitment to the company, its story, and its people is amazing. Therefore, it is with particular sadness that I report that Brad passed away in November 2005, as this manuscript was being prepared for submission. He gave years to the company and then years more to chronicling its history. Needless to say, Brad was quite pleased when SAE International offered us a contract to publish this book.

Most of the illustrations and written materials used in this project came from our personal collections. In the illustration captions and endnotes, if no credit is given, then the material came from the holdings of Bradford or Dias.

Brad dedicated his 1989 Hall-Scott manuscript to his wife Helen “for her patience.” Considering how much time, attention, and money went into the entirety of this project—from Brad’s manuscript that was finished in 1989 to the present book—I cannot imagine a more appropriate dedication. Thus, I continue his acknowledgment in this book. It appears that Brad and I have been similarly blessed with terrific spouses. Both Helen Bradford and Kim Stanley-Dias supported their husbands, inexplicably perhaps, as we lavished inordinate amounts of time, money, and affection not on either of them but on a history project—and on an old engine maker, no less. I could not have asked for a more generous and steadfast supporter as I worked on the Hall-Scott story early in the morning, late in the evening, over weekends, and on holidays. I took trips and side trips, fielded phone calls at dinner, and had my focus diverted for years. A bright red 2150-pound Hall-Scott truck engine resides discretely in our backyard, while several shelves in our house overflow with Hall-Scott memorabilia. Kim, similar to Helen with Brad, only encouraged me. That’s love. Therefore, this book is sincerely dedicated to Helen Bradford and Kim Stanley-Dias.

Ric Dias
January 2006

INTRODUCTION

Whatever happened to Hall-Scott?

Hall-Scott engines have been remembered for having great power, long lives, and even good looks. Enthusiasts of classic airplanes, trains, boats, trucks, buses, fire equipment, and engines often recall the company and its products with great admiration—even fondness. Forty years after the last new Hall-Scott left a factory, people still sing the praises of these engines. For decades, the motoring press heaped favorable reviews on Hall-Scott for its products. Although Hall-Scott produced tens of thousands of engines of acknowledged high quality and performance, the company nevertheless closed its doors after a 48-year run. Another company kept the Hall-Scott name alive on new engines for another decade and then discontinued the line. This provokes an obvious question: Why did a company that designed and built such capable and respected products fail in the marketplace?

Hall-Scott has a fascinating history. While its primary endeavor was building gasoline-powered internal combustion engines, Hall-Scott did not hesitate to branch into making other promising products. For example, in its early years in the 1910s, the company manufactured motorized railroad cars of various sizes and configurations—for passengers, freight, or maintenance—with many powered by Hall-Scott engines and transmissions. In that same period, Hall-Scott also sold engines to the airplane market and briefly became a leading firm in the design and manufacture of aircraft propulsion. Lured by the awesome sales potential of a young and rapidly growing sector of the engine market, the company abandoned making aviation engines and motorized railcars in the 1920s to serve the booming truck and bus businesses. Also during the 1920s, Hall-Scott briefly built an innovative two-speed rear axle for the Ford Model T but did not remain in the axle business after this successful venture. During both world wars, Hall-Scott contributed significantly to the war effort. In World War I, the company built hundreds of aircraft engines for the American military and for a handful of Allied countries. In World War II, Hall-Scott built thousands of motors for naval vessels and tank transporters. And in the early Cold War, Hall-Scott attempted to embrace the rise of high technology by purchasing a few small electronics firms. A narrow and one-dimensional company Hall-Scott most definitely was not.

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Hall-Scott personnel and fans have pointed proudly to a host of significant advances and firsts in engine design from the company. Although some of these claims can be contested by other firms or individuals, the list includes claims of being the first American engine maker to use a full-flow oil filter and the first American aircraft engine maker to use die-cast aluminum pistons. Hall-Scott was early among American engine makers to make widespread use of the overhead camshaft and “hemi” head. Hall-Scott also was an early user of aluminum in engine crankcases to minimize weight. The first airplane to make an international mail flight was Hall-Scott powered. Hall-Scott participated in significant ways to assist American military efforts in both world wars. Arguably, Hall-Scott’s finest hour came in its role (through cofounder E.J. Hall) in the design of the much heralded Liberty motor of World War I. Patents held by Hall-Scott personnel number in the dozens.

The story of Hall-Scott, as small a company as it might have been, points to issues of national scope. The company was born in an era when American entrepreneurs could successfully enter auto, truck, and engine making. Gasoline and diesel engines, along with the automobile, were invented in the late nineteenth century, only a few years before Hall-Scott commenced production. At this time, the technology used in making engines was simple; thus, the skills and tools needed to be competitive were easily within the reach of a hard-working and skilled individual with minimal capital. Hall-Scott enjoyed a measure of success in the ensuing decades in its volatile and crowded industry, watching as most of its competitors disappeared. But by the post-World War II period, engine making (and associated fields) had become much more sophisticated and capital intensive. Entrepreneurs were not entering the engine and auto industries and achieving success as they had done around 1900. Although Hall-Scott had built tens of thousands of engines and other items, it did not have the needed capital, and perhaps the right management, to develop and diversify its product line to remain competitive. The contraction of the number of American engine, auto, and truck makers continues into the twenty-first century. Hall-Scott was only one of the thousands of casualties caught in this slow and merciless grind.

The most frequently cited reason for the demise of Hall-Scott was that it did not have a successful line of diesel engines. To wit, as the company’s fortunes sank to new lows in the late 1950s, Hall-Scott leadership described the primary reason for losing its (already small) market share as competition from other engine makers, especially those that made diesel power units. A 1975 magazine article on an E.J. Hall-built car explained the demise of Hall-Scott as

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resulting from Hall-Scott not having a successful diesel as that type of motor came to dominate commercial engine uses. Indeed, other Hall-Scott insiders and interested observers have likewise noted that lacking a viable diesel engine program left Hall-Scott at a pronounced disadvantage.

Not having a successful line of diesel engines is an adequate, short explanation for the failure of Hall-Scott. Few other commercial engine makers have survived without having diesels, or very many, in their product offerings; Lycoming and Wisconsin are examples. On the other hand, simply because a company builds diesel engines has been no guarantee for success. This point is cogently driven home by the shared fate of three other San Francisco Bay Area engine makers: Atlas-Imperial, Enterprise, and Union. These firms produced large diesel marine engines, and all are long gone. This one factor—not having a successful diesel engine—is an essential piece of the puzzle to explain the death of Hall-Scott, but it fails to provide a complete answer.

Current literature does not offer a detailed history of the company, much less why it closed its doors. References to Hall-Scott can be found in many books but offer only a limited portion of the story. Excluding books that mention the company, which are great in number because Hall-Scott engines powered so many different kinds of vehicles for so many years, a diligent researcher can collect nuggets of Hall-Scott information from trade publications, company brochures, company annual reports, newspapers, business publications, and other hard-to-find esoteric sources in scattered places. However, large volumes of information on the company in any one place are fantastically difficult to find, and this has hampered efforts to write a complete and published Hall-Scott history. This is the first book on this much discussed and greatly admired company.

The present book grew from “A History of the Hall-Scott Motor Car Company,” an unpublished manuscript written by Francis H. (Brad) Bradford in 1989. Bradford worked as an engineer at Hall-Scott for 18 years, and he helped oversee the plant shutdown in 1958. Recognizing the great worth contained in the materials that he was ordered to throw away, he squirreled away boxes of letters, photos, brochures, and drawings. Most of the Hall-Scott records nonetheless were lost. The company leadership had little regard for saving company materials for posterity. With his “insider” Hall-Scott connections, Brad enjoyed access to materials that were not available to others. Uniquely armed with these resources, Brad created the first detailed account of Hall-Scott. Copies of the manuscript can be found at several repositories around Berkeley, where

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Hall-Scott maintained its main factory and Brad lived. For Brad, this effort was a labor of love. He spent more than a decade making his own manuscript, and three years contributing to this present collaborative book project.

This book builds on the primary documents isolated by Brad and supplements them with period newspapers, trade journals, business publications, more recent books, and other sources. The troublesome scarcity of materials on Hall-Scott has not been solved, but a determined attempt has been made to find what materials do exist. Perhaps a future researcher can tell more of this story by finding materials that have yet to be uncovered. This study aims to place the Hall-Scott Motor Car Company in its rightful position as an American engine maker of importance and as a barometer of the changing face of engine making in the twentieth century.

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CHAPTER ONE



HALL-SCOTT'S FOUNDERS AND FORMATIVE YEARS

The founders of Hall-Scott, Elbert J. Hall and Bert C. Scott, possessed some complementary talents that strengthened their enterprise and allowed it to buck the automotive industry trend of companies having a brief life span. Hall brought with him impressive mechanical talents, while Scott provided management experience, funding, and connections to local businesses. What's more, Hall and Scott picked an advantageous time in which to launch their venture. By the time Hall-Scott made the last engine in its own factory some 50 years later, however, the American engine industry had undergone a slow and fundamental change, and openness to entrepreneurial newcomers was no longer the case. In its first ten years of operation, though, Hall-Scott took advantage of opportunities as they came along, often responded to the market effectively, carved out a niche in which it could compete, and pushed along its industry.

Hall, Scott, and Their New Company

Elbert John Hall, sometimes called "Al" by friends, was born in San Jose, California, in 1882. [1-1] From an early age, Hall demonstrated an uncanny ability to understand, improve, and build machines, most notably gasoline-powered internal combustion engines. Thinking about engines and things mechanical seemed to dominate his thoughts. A 1918 article on Hall appearing in his hometown newspaper wrote that as a boy, "throughout his brief school career, his engine pictures and models were his playmates; the other children were distant grandstand spectators and the teacher, a necessary nuisance." [1-2] Hall was a decent but not great student and, according to this article, seemed

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largely bored with the subject matter presented. Hall “listened intently to his teacher, when it was urgently necessary, and at all other times drew pictures of engines both large and small, with the assistance of a squeaky slate-pencil and a curling tongue, much to the admiration of the rest of the small-fry.” Hall’s inauspicious academic career ended in the seventh grade. Evidence could not be found that he ever attained a diploma or credential of any kind, although he may have taken some sporadic courses, such as night classes, when he was older. Hall’s mechanical abilities were inborn, augmented by experience.

The subjects of many of Hall’s drawings, gasoline engines, were still in their infancy at the time, having been invented only a few years earlier in Europe. Otto of Germany had patented his four-cycle engine in 1876, the first practical example of the basic combustion process ultimately used in most gasoline engines. Gasoline engine technology quickly made its way across the Atlantic Ocean to the United States, and applications using this versatile power plant mushroomed in number. The new technology came to California shortly before Hall began his mechanical tinkering. New as they were, engines captured his imagination and helped lead to his first job. That same 1918 newspaper article stated that shortly after quitting school, Hall left home and boarded with a local baker. [1-3] Young Hall assumed his sick brother’s position, driven to take the job for several reasons, in part because of “that tempting looking motor in Keyes’ candy place next door.” Hall drew and designed motors when not baking, preparing himself for the next phase of his engineering training, when he would start working on engines.

As a 17-year-old boy, Hall obtained a position with a farmer, fixing engines that pumped water for irrigation. [1-4] His duties of tinkering with pumping engines and other devices in the Santa Clara Valley did not last long. I.L. Burton, the San Francisco company that had sold Hall’s employer the problem-prone Atlas engine that had won young Elbert his job, requested his skills at its operation. Burton reportedly said to Hall’s employer, “Send that boy to me, he’s just the sort I want.” [1-5] So in 1901, Hall began a stint at the I.L. Burton Machine Works. Burton sold engines for a variety of uses, and while there, Hall designed gasoline engines for his employer. Around this same period, Hall also designed a small industrial motor of some acclaim, the “Doak,” which was marketed by the well-known West Coast-based company Henshaw, Bulkley and Co. [1-6] In 1902, even though not yet 20 years of age, Hall acquired a half-interest in I.L. Burton. Hall continued working with engines, inside and outside the walls of Burton, including repowering cars with improved engines to better climb San Francisco’s legendary hills and to race. From these humble beginnings, E.J. Hall’s impressive engineering career had begun. Henry Ford, Jesse Vincent,

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Clessie Cummins, and many others who became famous in the automotive field in the early twentieth century did so without the benefit of having college engineering degrees. This career path is virtually unheard of in engine building a hundred years later.

Hall formally entered the automobile business when he joined the newly formed Heine-Velox Company of San Francisco. Gustav Heine had immigrated to the United States in the 1870s. After succeeding as a piano maker, he tentatively inched into the car business in 1904, assembling all of three cars by 1906. [1-7] Heine historian Tikker wrote that Hall served as “works driver, repairman, chauffeur, salesman and general partner,” and several newspaper accounts credited Hall with helping in the design of the Heine-Velox car. [1-8] It is unclear, however, if Hall had any engineering input in the creation of the Heine-Velox motor. Heine-Velox had two engines, both with in-line four-cylinder designs. Their cylinders were cast in pairs of two and had overhead valves, producing either 30–35 or 40–45 hp. [1-9] The Heine-Velox car was impressive, being



In his business operations, as in this Heine-Velox car, the headstrong Gustav Heine was in the driver's seat, and Elbert Hall was in the passenger's seat.