

LIBERTY UNVIVERSITY

FACTORY HOT ROD: CARROLL SHELBY'S MELDING OF DETOIT INDUTRY AND  
HOT ROD CULTURE

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## Introduction

There are over 260 million cars registered in America, and an increasing number of Americans view their vehicles as strictly a form of personal transportation. Market research studies have shown that millennials are buying fewer cars as from 2007-2011, new car sales among millennials dropped by 30 percent.<sup>1</sup> This trend will likely increase as technology continues to create impersonal vehicles with the development of driver-assisted cars and even completely autonomous vehicles. While this technology might sound futuristic, the company Uber as of early 2016, is testing completely automated cars in Pittsburgh.<sup>2</sup> Soon Americans will be able to call a car to their current location and be transported to any destination without having to physically control their vehicle. While this type of innovation will propel society forward into an era of more convenient form of travel, future generations will lose out on the experience of owning and driving a car. However, even though car manufacturers continue to innovate and add new technologies, many Americans choose to buy vintage cars from the 1950s and 1960s.

American car collectors spent \$1.32 billion at classic car auctions in 2015, and often spend hundreds of thousands of dollars more on a car than the original sticker price.<sup>3</sup> For example, in 1965, Americans could purchase a 427 Cobra for around \$7,000, but that same car today is worth well over \$1.5 million.<sup>4</sup> This value might come as a surprise to millennials today, but an individual who purchases this car is buying more than just steel and rubber but rather a

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<sup>1</sup> Andrea Dempsey, "Why Are Millennials Buying Fewer Cars?" poster presentation, The Ohio State University, April 1, 2016, accessed November 12, 2016, <https://kb.osu.edu/dspace/handle/1811/76329>.

<sup>2</sup> Mike Isaac, "What It Feels Like to Ride in a Self-Driving Uber," *The New York Times*, September 14, 2016.

<sup>3</sup> Andrew Newton, "Graph of the Week: Total Auction Sales Still Growing," Hagerty, October 2, 2015, accessed November 12, 2016, <https://www.hagerty.com/articles-videos/Articles/2015/10/02/Graph-of-the-Week-Total-Auction-Sales-Still-Growing>.

<sup>4</sup> "Lot #5090 1965 Shelby Cobra 427 Roadster CSX 3169," Barrett-Jackson The World's Greatest Collector Car Auctions, accessed November 12, 2016, <http://www.barrett-jackson.com/Events/Event/Details/1965-SHELBY-COBRA-427-ROADSTER-CSX-3169-180026>.

piece of Americana. The reason why this car commands such a high price is not solely its performance or looks, but because of its designer, Carroll Shelby. There are few individuals within the automotive culture that stand higher than Shelby. The problem is that few Americans recognize his contributions to American culture. Oftentimes, his success is boiled down to the development of the Mustang GT350, GT500, or Cobra.<sup>5</sup> While these are important milestones within Shelby's career, it is only a fraction of his legacy, which includes his service as a sergeant pilot during World War II and becoming one of the first American drivers to win the 24hrs at Le Mans.<sup>6</sup>

Several books discuss Carroll Shelby, but most focus on either his racing career from 1952 to 1960, or his creation of the Shelby Cobra in 1962. The most notable work, Rinsey Mills' *Carroll Shelby: The Authorized Biography*, provides a detailed timeline of Shelby's life, which helps to establish context for this project.<sup>7</sup> The only issue with Mill's work is he generally abstains from making overarching historical analysis. Wallace A. Wyss, in *Shelby: The Man, The Cars. The Legend*, exemplifies this fixation on Shelby's racing career and Cobra creation. Although, Wyss goes further and analyzes Shelby's time with Chrysler and how he renewed his relationship with Ford in 2000.<sup>8</sup> Another notable work is Trevor Legate's, *Cobra: The First 40 Years*. He primarily discusses how Carroll Shelby took the AC Ace and transformed it into the Cobra by transplanting a Ford V8 into the small British chassis.<sup>9</sup> What differentiates Legate from

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<sup>5</sup> R&T Staff, "The 6 Most Important Carroll Shelby Performance Cars," *Road & Track*, last updated May 13, 2014, accessed on April 13, 2017, <http://www.roadandtrack.com/car-culture/a7842/six-significant-shelbys-1399667433/>.

<sup>6</sup> Carroll Shelby, *The Cobra Story* (New York: Trident Press, 1965).

<sup>7</sup> Rinsey Mills, *Carroll Shelby: The Authorized Biography* (Minneapolis, MN: Motorbooks, 2012).

<sup>8</sup> Wallace A. Wyss, *Shelby: The Man. The Cars. The Legend* (Hudson, WI: Iconografix, 2007).

<sup>9</sup> Trevor Legate, *Cobra: The First 40 Years* (Minneapolis, MN: Motorbooks, 2006).

other sources is that he discusses the back-story of the British car company AC, and how it eventually developed a relationship with Carroll. According to Legate, Carroll was not the first person to transplant an American engine into an Ace. AC in 1957 sent cars to America without their engines, so that racing teams could place a Chevrolet Corvette engine into the car.<sup>10</sup> While these works are important, they lack a proper analysis of Shelby and the reasons why he is important to American culture. Since his death on May 10, 2012, there has been some analysis of his life, but scholars generally neglect to place him within the larger context of American culture.

One of the primary acknowledgments to the importance of Shelby's life and contributions was not published by a university press or peer reviewed journal, but by the car magazine *Motor Trend*. It published, *Shelby*, in 2012 and provides a quick overview of Shelby's life from his time in the military to his charity foundation that in part raises money for the Children's Medical Center in Dallas.<sup>11</sup> Another notable work on Shelby is, *Remembering The Shelby Years, 1962-1969*, by Dave Friedman. Friedman's work is set apart from the rest because of his use of primary source material. Instead of just discussing the Cobra and how Shelby raced the car, Friedman uses the testimony of those around Shelby to tell his story. For example, Friedman records mechanic Bruce Burness's experience working for Shelby in the engine shop beginning in January 1963. Burness recounts, "It was the type of job and atmosphere that I couldn't wait to get to in the morning."<sup>12</sup> This work provides a personal touch to the Cobra program. However, these works merely discuss what Shelby accomplished and rarely examine his overall place within American culture.

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<sup>10</sup> Ibid., 32.

<sup>11</sup> Motor Trend, *Shelby: A Tribute to An American Original* (Minneapolis, MN: Motorbooks, 2012).

<sup>12</sup> Dave Friedman, *Remembering the Shelby Years- 1962-1969* (Los Angeles: The Carroll Shelby Children's Foundation, 1998), 26.

The historiography regarding Shelby primarily focuses on his racing and automotive career, and most sources overlook his time in the military. While his autobiography, *The Cobra Story*, published in 1965 discusses his experience as a sergeant pilot, few academic sources examine how this influenced his success as a driver, and his relationship to hot rod culture in Southern California. Shelby joined the Air Corps on April 11, 1941, and was stationed at Randolph Field in Texas.<sup>13</sup> After basic training, he was assigned to a fire station as a truck driver. Although he was always fascinated with flying, he did not initially qualify to become a pilot because of his lack of education. However, as it became clear that America would eventually enter the war, Congress passed public law 99, which allowed men like Shelby the opportunity to fly.<sup>14</sup> According to Carroll, the military commissioned him in September 1941 as a flying sergeant.<sup>15</sup> While Carroll never flew combat missions, he experienced the thrill of flying, and trained pilots in the proper bombing techniques in B-25s and B-26s.<sup>16</sup> Furthermore, he learned how to effectively operate under life and death situations, which would aid him as a driver. Carroll applied his experience as a sergeant pilot to win races including Le Mans.

While as a co-driver, Shelby won the 24hrs race at Le Mans, France in 1959, which is considered one of the most prestigious races in the world.<sup>17</sup> France has a long history of racing and organized large races starting in 1895.<sup>18</sup> Auto racing culture in France quickly developed as more teams entered events around France, and by May 1903, over 270 cars entered into the Paris

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<sup>13</sup> Mills, *Carroll Shelby*, 19.

<sup>14</sup> *Ibid.*, 20.

<sup>15</sup> Shelby, *The Cobra Story*, 13.

<sup>16</sup> *Ibid.*, 25.

<sup>17</sup> Friedman, *Remembering the Shelby Years- 1962-1969*, 31.

<sup>18</sup> Quentin Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1923-29* (New York: Evro Publishing Limited, 2016), 17.

Madrid race.<sup>19</sup> These races would draw huge crowds with around two million spectators at Paris Madrid. Furthermore, the event gained international attention by 1904 with teams entering from Austria, Belgium, Britain, Denmark, Russia, and the United States. Motorsports were put on hold during World War I, but after the armistice ended hostilities the *Automobile Club de l'Quest* or ACO started organizing races. Under the direction of George Durand, Charles Faroux, and Emile Coquille the ACO settled on a 10.73-mile course known as Circuit de la Sarthe near the city of Le Mans.<sup>20</sup> Now that the ACO had a location, the committee wanted to organize a race that would challenge both driver and machine.

The ACO decided on a 24hr race, which meant that in order to win the race teams needed to develop not only fast, but reliable cars. Also, the ACO created a formula that awarded points at the end of race based on the vehicle's weight, engine volumes, body type, distance covered, and average speed. This allowed for a variety of different classes of cars to participate, and matched cars based on performance specifications.<sup>21</sup> During the first race in 1923 only three vehicles retired due to mechanical problems, but each year as the speed increased, so did the mechanical failures and accidents. The race in 1925 saw 33 teams quit, which seven were due to accidents.<sup>22</sup> Also, Le Mans had its first fatality when Marius Mestivier lost control of his Amilcar CGS and rolled several times just after passing the grandstands.<sup>23</sup> By the time Shelby won at Le Mans, it had secured its reputation as a deadly track with a total of nine fatalities. However, his victory at Le Mans in of itself does not account for his significance within

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<sup>19</sup> Ibid., 16.

<sup>20</sup> Ibid., 31-32.

<sup>21</sup> Ibid., 34.

<sup>22</sup> Ibid., 328.

<sup>23</sup> Ibid., 157.



American history. The reason is that there were other American drivers, Phil Hill and Luigi Chinetti, who won at Le Mans in 1949 and 1958 respectively. While Shelby sealed his legacy as a driver by winning Le Mans, he was never satisfied with his success, and worked to combine hot rod culture and the Detroit automotive industry in order to develop the Cobra.

Shelby retired from racing at the age of 37 in part because doctors diagnosed him with angina pectoris. Instead of settling into his post-racing career as a distributor for Goodyear, Shelby set his goal on building the ultimate production car under the banner of his company Shelby American.<sup>24</sup> Initially Shelby went to Chevrolet to strike a deal with them, but the company turned him away. It reasoned its current performance vehicle, the Corvette, did not need any internal competition. Shelby found a much more receptive ear at Ford, and the head of Ford's stock car racing program supplied Shelby's project with two Ford 221 engines in 1961.<sup>25</sup> For nearly a decade, Ford and Shelby worked together to build one of the world's most iconic cars. Furthermore, what helped Shelby succeed was his ability to apply hot rod technology to Detroit engineering. For example, he developed the Cobra in a California speed shop, which allowed Shelby and his crew to build new parts as needed.<sup>26</sup> Shelby American demonstrated to the world that a bunch of hot rodders could take on racing giants like Ferrari and win. The Cobra won first place in the GT class at Le Mans in 1964 and went on to the Federation Internationale de l'Automobile (FIA) International Manufacturers Championship in 1965.<sup>27</sup> Ford witnessed Carroll and Shelby American's success at building racecars, and Ford hoped they could do the same for its GT40 program.

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<sup>24</sup> Dave Friedman and John Christy, *Carroll Shelby's Racing Cobra* (Minneapolis, MN: Motorbooks, 1990), 10.

<sup>25</sup> *Ibid.*, 12.

<sup>26</sup> *Ibid.*, 154.

<sup>27</sup> Shelby, *The Cobra Story*, 255; 261.

Henry Ford II in 1963 was out to make Ferrari pay for backing out of a business deal. Ford offered to purchase Ferrari from Enzo Ferrari, but the former reneged on the deal just before it was completed. Ford made it his personal mission to beat Ferrari at its own game, and his engineers developed the GT40.<sup>28</sup> However, by the time Ford built and began racing its high-tech sports car in 1964 it failed to defeat Ferrari. At the 12 hours of Reims, all three of their GT-40s failed to even complete the race, and Ferrari went on to win the top three positions.<sup>29</sup> In an effort to save the project, Ford turned to Shelby and his team of hot rodders to help him finally beat Ferrari. Shelby and Ferrari had their differences going back to 1955, when Shelby refused to drive unpaid for Ferrari. Their rivalry would continue throughout the 1960s, but would be settled at Le Mans.<sup>30</sup>

Shelby American began working on the GT40 and placed Ken Miles in charge. They went to work testing and tuning the car.<sup>31</sup> Ford made the right decision and Shelby's team brought Ford his first victory at Daytona Continental in 1965.<sup>32</sup> Shelby would personally see to it that Ford's GT40 beat Ferrari at Le Mans in 1966.<sup>33</sup> It seemed that anything Shelby touched turned into a winner, and Ford then entrusted the hot rodders at Shelby American to transform the Mustang into a thoroughbred.

The Ford Motor Company took note of Shelby's ability to transform the Cobra and GT40 into a dominant racecar, and saw an opportunity to transform the Mustang. The 1964 Mustang

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<sup>28</sup> A.J. Baime, *Go Like Hell: Ford, Ferrari, and Their Battle for Speed and Glory at Le Mans* (New York: Houghton Mifflin Harcourt, 2009), ix.

<sup>29</sup> *Ibid.*, 120.

<sup>30</sup> *Ibid.*, 37.

<sup>31</sup> *Ibid.*, 125.

<sup>32</sup> Mills, *Carroll Shelby: The Authorized Biography*, 353.

<sup>33</sup> *Ibid.*, 418.

was a huge success for Ford and sold 121,538 in the first year alone.<sup>34</sup> Although the Mustang proved to be a popular design, it failed to fulfill Ford's desire for a total performance package. Customers could only purchase a 210-horsepower motor, and the designer of the Mustang, Lee Iacocca, offered Shelby the chance to add his personal touch.<sup>35</sup> Originally, Shelby asked for \$15,000 from Ford to upgrade two Mustangs, but Iacocca provided \$1,500 for the project. However, this lack of support demonstrates how Shelby combined hot rod culture and Detroit automotive industry to create a better performing Mustang.<sup>36</sup> Shelby accepted the challenge and had his team including Peter Brock and Ken Miles, at Shelby American develop the Mustang GT-350. Ford wanted to race its performance Mustang in the B/Production class of SCCA. The SCCA mandated that cars competing in this class could only modify the engine or suspension, but not both. Shelby understood the ingenuity of hot rod culture and placed his performance shop, Shelby American, near the epicenter in California.

This work ultimately places Shelby into context and while examining Shelby's life and career, it also defines how he fits into the automotive culture represented by both hot roding and the Detroit industry. There are several works discussing Detroit industry such as John Heitmann's *The Automobile and American Life*. This work provides an overarching analysis of Detroit industry, and how it developed and progressed throughout the twentieth century.<sup>37</sup> Furthermore, it focuses on some of the key individuals such as Henry Ford the founder of Ford, and Billy Durant one of the founders of General Motors. Another notable work for this study is

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<sup>34</sup> Kirk Seaman, 2015, "Warning: Graphic Content! 50 Years of Camaro vs. Mustang Sales Numbers in Living Color," Car and Driver, May 20, accessed November 12, 2016, <http://blog.caranddriver.com/warning-graphic-content-50-years-of-camaro-vs-mustang-sales-numbers-in-living-color/>.

<sup>35</sup> Colin Comer, *Shelby Mustang Fifty Years* (Minneapolis, MN: Motorbooks, 2014), 23-28.

<sup>36</sup> *Ibid.*, 33.

<sup>37</sup> John Heitmann, *The Automobile and American Life* (Jefferson, NC: McFarland & Company, Inc., Publishers, 2009).

Guillermo Giucci's *The Culture of the Automobile: Road to Modernity*. He focuses on how the car shifted American culture and completely changed the way people interact with each other.<sup>38</sup>

Along with studying Detroit industry, scholars have also published works concerning the subculture of hot rodding.

There are several works discussing the birth of American hot rodding including H.F. Moorhouse's *Driving Ambitions: An Analysis of the American Hot Rod Enthusiasm* which provides an overall analysis of hot rodders and where they raced from dry lakes to drag strips.<sup>39</sup> Another notable work is by Michael Dobrin and Philip Linhares' *Hot Rods and Customs: The Men and Machines of California's Car Culture*. They outline how hot rodding became more organized over the twentieth century from local cars meets in the 1920s to national organizations after World War II.<sup>40</sup> However, all of these works generally stay within their own culture of either Detroit industry or hot rodding. Examining Shelby's life will bring these two groups together in a distinctive way.

Overall, Shelby's life demonstrates a unique perspective into American culture, and how veterans reintegrated into America after World War II. Shelby's time as a training pilot prepared him for his career as a racing driver and enabled him to reach the pinnacle of the sport by winning Le Mans. Also, his military service benefited his career as a builder because he could easily work with other veterans within the hot rod subculture. This relationship allowed Shelby to apply the mechanical and engineering skill of hot rodders and the reliability of Detroit industry to his own plans for the Cobra. Furthermore, Shelby applied this same formula to Ford's

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<sup>38</sup> Guillermo Giucci, *The Cultural Life of the Automobile: Roads to Modernity* (Austin: University of Texas Press, 2012).

<sup>39</sup> H.F. Moorhouse, *Driving Ambitions: An Analysis of the American Hot Rod Enthusiasm* (New York: Manchester University Press, 1991).

<sup>40</sup> Michael Dobrin and Philip E. Linhares, *Hot Rods and Customs: The Men and Machines of California's Car Culture* (Oakland: Oakland Museum of California, 1996), 8-23.

GT40 project, and helped Ford end Ferrari's Le Mans championship dynasty. Shelby's contributions to American culture need to be understood as a whole and can only be appreciated by analyzing the relationship between his careers as veteran, driver, and automotive designer.

## Chapter 1: Automotive Culture: Detroit Industry and Hot Rodding

Americans today can hardly fathom a society without access to their own vehicle. The modern American views their car as a form of personal expression and a representation of their independence. According to the Federal Highway Administration, the average American between the ages sixteen to sixty-five drives around 13,476 miles per year.<sup>41</sup> However, in 2015 the Department for Transportation in the United Kingdom reported that the average individual only drove 7,900 miles per year.<sup>42</sup> This greater distance in mileage is in part attributed to the vast size of the United States, which forced Americans beginning in the twentieth century to rely on personal transportation. However, the vast size does not account for everything as the French in 2010, drove an average of 8,600 miles per year.<sup>43</sup> There is something intrinsically ingrained within American culture to rely on a personal vehicle for transportation.

While America was the first country to tame and harness the power of the automobile, it was not the region to initially develop the technology. According to historian John Heitmann, Europe was the birthplace of the modern vehicle.<sup>44</sup> English inventors tested steam engine powered vehicles as early as 1820, and these were initially dubbed road locomotives. Furthermore, the basic layout of the automobile with the engine in front and the drive wheels in

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<sup>41</sup> “Average Annual Miles per Driver by Age Group,” *U.S. Department of Transportation Federal Highway Administration*, last modified July 13, 2016, accessed on March 25, 2017, <https://www.fhwa.dot.gov/ohim/onh00/bar8.htm>.

<sup>42</sup> “Provisional Road Traffic Estimates Great Britain: January 2016-December 2016,” *Department for Transport*, February 9, 2017, accessed on March 25, 2017, [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/590516/prov-road-traffic-estimates-jan-2016-to-dec-2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/590516/prov-road-traffic-estimates-jan-2016-to-dec-2016.pdf).

<sup>43</sup> Arvids Linde, *Electric Cars- The Future is Now!: Your Guide to the Cars You Can Buy Now and What the Future Holds* (Dorchester, UK: Veloce Publishing, 2010), 59.

<sup>44</sup> John Heitmann, *The Automobile and American Life* (Jefferson, NC: McFarland & Company, Inc., Publishers, 2009), 9.

back was developed in France in 1891.<sup>45</sup> However, it was in America that the car was embraced and combined with European influence further developed. Some of the first builders in America employed French car manufacturers within their design process, but even with these Europeans the Americans quickly developed their own iteration of the car.<sup>46</sup> While more Americans were being introduced to the automobile, the location of production began to centralize in Detroit, Michigan.<sup>47</sup>

By the early twentieth century, Detroit became a hub for automotive builders and around a hundred and twenty-five different companies settled within the region. According to Thomas Surgrue, automakers were attracted to the region due to geographic features and a preexisting industrial infrastructure.<sup>48</sup> Detroit is located within the central United States and more importantly, it sits close to the Great Lakes. This allowed builders the means to quickly ship their product around the United States. Another important factor was the availability of metal ores including iron and copper. These materials are vital to the construction of automobiles, and Ford settled within the region to help reduce the overall cost to ship these materials to their factory. In the early 1900s, Ford worked for the Detroit Automobile Company as a chief engineer, but found their focus on turning a profit distracted from his ability to innovate. By March 1902, he left and started his own one room shop in Detroit to design and

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<sup>45</sup> Ibid., 10-11.

<sup>46</sup> Ibid., 18.

<sup>47</sup> Thomas J. Sugrue, "Motor City: The Story of Detroit," *The Gilder Lehrman Institute of American History*, accessed on March 25, 2017, <https://www.gilderlehrman.org/history-by-era/politics-reform/essays/motor-city-story-detroit>.

<sup>48</sup> Ibid.

develop his own car.<sup>49</sup> While Detroit was not a large city, only the thirteenth largest in the country, it had already become a central location for industrial manufacturing from cigars to medical products.<sup>50</sup>

This was an important step within the automotive development in Detroit because it established infrastructure that could handle new forms of manufacturing. Henry Ford's family emigrated from Ireland and settled the Detroit region in 1840. Henry Ford worked for the Detroit Edison Company, but shifted towards automotive manufacturing as more builders moved and set up shop.<sup>51</sup> Immigrants who settled in Detroit were primarily looking for blue-collar work. The influx of people provided the necessary workforce in order to operate an automobile manufacturing facility.<sup>52</sup> While the automobile industry began to emerge as part of American society in the early twentieth century and industry, it was often reserved for the rich.

The personal automobile was an expensive luxury that few Americans could hope to afford. The primary reason is the time and energy which went into making each car. Since most of the cars were built by hand, the work required highly skilled craftsmen to construct each piece.<sup>53</sup> Entrepreneurs desperately tried to develop a means in which to reduce the total cost of the average car and at the same time increase production. The Cadillac Automobile Company in 1902 was able to produce around 2,500 cars, but even with increased production the \$850 price

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<sup>49</sup> Henry Ford, *Henry Ford My Life and Work* (Luxembourg: CreateSpace Independent Publishing Platform, 2013), 8-15.

<sup>50</sup> Ibid. Thomas J. Sugrue, "Motor City: The Story of Detroit."

<sup>51</sup> "People and Discoveries: Henry Ford 1863-1947," *A Science Odyssey*, accessed on March 25, 2017, <http://www.pbs.org/wgbh/aso/databank/entries/btford.html>.

<sup>52</sup> Ibid.

<sup>53</sup> "Henry Ford: Henry Ford Videos," *HISTORY*, accessed on March 25, 2017, <http://www.history.com/topics/henry-ford/videos/history-of-the-holidays-the-story-of-labor-day>.



tag placed it well beyond the means of the average consumer.<sup>54</sup> According to U.S. census data, the average worker in 1905 America made roughly \$10 per week.<sup>55</sup> If the average American saved every penny made, they would need to save around eighty-five weeks before they could purchase a new Cadillac. Even Henry Ford's Model T was initially plagued with this same issue, and the cost of production forced him to raise the price of his car to around \$850. However, Ford looked towards other industries such as meatpacking and grain mills for ways to increase efficiency and lower production costs.<sup>56</sup>

Prior to Henry Ford's implementation of the powered assembly line in 1910, it took around sixteen hours for workers to complete a single Model T. This was a slow and arduous process. In order to reduce overall costs Ford looked at four key areas that needed refinement: exchangeable parts, uninterrupted movement, separation of work, and diminishing wasted labor.<sup>57</sup> Tony Swan notes that early auto manufacturers would place workers all on the same vehicle until it was completed.<sup>58</sup> Ford and his associate Charlie Sorensen worked to further develop the building process. Robert Lacey suggests that Ford looked around and noticed how innovation had sped up the production time for other manufacturers such as Samuel Colt and his revolver. At this time, the Colt factory used a type of assembly line to build each firearm, and so

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<sup>54</sup> "This Day In History: 1901 General Motors Buys Cadillac," *HISTORY*, accessed on March 25, 2017, <http://www.history.com/this-day-in-history/general-motors-buys-cadillac>.

<sup>55</sup> Department of Commerce and Labor Bureau of the Census, *Census of Manufactures: 1905 Earnings of Wage-Earners* (Washington: Government Printing Office, 1908), 11.

<sup>56</sup> "People and Discoveries: Ford Installs First Moving Assembly Line 1913," *A Science Odyssey*, accessed on March 25, 2017, <http://www.pbs.org/wgbh/aso/databank/entries/dt13as.html>.

<sup>57</sup> *Ibid.*

<sup>58</sup> Tony Swan, "Ford's Assembly Line Turns 100: How It Really Put the World on Wheels," *Car and Driver*, April 2013, accessed on March 25, 2017, <http://www.caranddriver.com/features/fords-assembly-line-turns-100-how-it-really-put-the-world-on-wheels-feature>.

Ford looked to apply this process to his factory.<sup>59</sup> Ford was eager to innovate his production line and if a more efficient way was discovered at any point, he quickly implemented the new process.<sup>60</sup> Instead of everyone working on a particular car, Ford and his associates decided to have each person perform one task on every car.

Before Ford fully implemented this within his company, he applied his theory to a single part of the Model T, the magneto. Instead of a single person building the entire magneto, Ford used twenty-nine people with each putting together a different part. The time to produce a single magneto instantly dropped from thirty-five minutes to around twenty-eight minutes. Ford and Sorensen continued to refine the process and reduced the time to about five minutes per piece.<sup>61</sup> Ford applied this to the entire production process and he quickly reduced the time to complete a single car. Another crucial development for Ford was his mandate that the car be interchangeable. This drastically reduced the price to build, fix, and repair a car. This allowed for a greater level of flexibility within production as parts can be shifted around or mass-produced depending on demand.<sup>62</sup>

To further increase productivity, Ford looked for ways to restructure the building in order to streamline the process of producing cars. Ford turned to an architect named Alan Kahn. Kahn designed Ford's new factory, Highland Park, with reinforced concrete, which allowed for a larger, more open space building than traditional construction. This allowed Ford to build a production line, with enough space for everything to freely move with little interruption.<sup>63</sup> Along

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<sup>59</sup> Robert Lacey, *Ford: The Men and the Machine* (Boston: Little, Brown and Company, 1986), 104.

<sup>60</sup> Ford, *Henry Ford My Life and Work*, 40-41.

<sup>61</sup> Tony Swan, "Ford's Assembly Line Turns 100."

<sup>62</sup> Lacey, *Ford: The Men and the Machine*, 106-107.

<sup>63</sup> Steven Parissien, *The Life of the Automobile* (New York: St. Martin's Press, 2013), 16.

with reorganizing his production line, Ford and other executives looked for ways to improve the quality of life for their work force.

The automotive industry during the early twentieth century was a dangerous job with little compensation. When Ford started building his factory, he modeled the wages and treatment of his employees off of the existing standard. This meant the company put its profits before the employee's well-being and companies based any decision off of this rule. At \$2.30 a day the men who worked at Ford could hardly afford to scrape by, and along with low pay they could be laid off at any point. For example, James Couzens, a Ford executive, noted, "We had been driving our men at top speed for a year and here we are turning them out to spend the Christmas holidays with no pay. The company had piled up a huge profit from the labor of these men; the stockholders were rolling in wealth, but all that the workers themselves got was a bare living wage."<sup>64</sup> Laying off workers was primarily done at times when the production lines were being retooled or at Christmas, and men would wait two or three weeks at the factory gates in the hopes they might be rehired that day.<sup>65</sup> Ford saw this practice as detrimental to the automotive industry and overall made little financial sense. He reasoned that successful business owners strive to buy the best materials, so why should they skimp on their labor force. Living and working for a company that has little concern for an individual's well-being does not inspire confidence among the staff, and Ford hoped to reshape the relationship between employee and employer.<sup>66</sup>

According to Ford the employee and employer relied on each other and when a person

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<sup>64</sup> Lacey, *Ford: The Men and the Machine*, 116.

<sup>65</sup> *Ibid.*

<sup>66</sup> Ford, *Henry Ford My Life and Work*, 65.

was hired to work for his company, they entered a partnership in which both rely on the other.<sup>67</sup> Ford had a bit of a revelation in December 1913 when he took his son Edsel on tour of the factory, and while exploring the pair ran into two of his workers fighting each other. Along with trying to kill each other, the pair was dirty, disheveled, and represented the depravity of society. After this encounter, Ford met with his executives and they worked out a plan to raise the pay rate of their employees to an unheard of \$5.00 a day. While the press and Ford announced it as a blanket pay increase, the reality is this only applied to those who met particular requirements. For example, they had to be twenty-two years old and work for the company at least six months. If an employee met these requirements, they received a bonus to their normal \$2.30 pay.<sup>68</sup> Also from an economic stand point because of the Great War, inflation had raised the price of goods to the point where the \$5.00 was really worth around \$2.80 in 1914. Furthermore, Ford did not exactly raise every employee's pay; it set a goal for them to reach. However, it was entirely attainable for them to double their pay. According to Steven Parissien, Ford also saw the potential of his employees becoming customers, and he desired to sell more Model T's.<sup>69</sup>

Ford looked to prepare and equip a motivated workforce to build cars. In 1916, he founded a trade school, Henry Ford Trade School, which trained the next generation for industrial jobs. According Guillermo Giucci, this school focused on three goals for students: creating a workforce, providing academic training that would benefit a trade, and instilling a sense of pride in students and their work. Ford also had the curriculum focus on how the

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<sup>67</sup> Ibid., 66.

<sup>68</sup> Lacey, *Ford: The Men and the Machine*, 118.

<sup>69</sup> Parissien, *The Life of the Automobile*, 16.

automobile was changing America and the world.<sup>70</sup> Ford stated, “Cities are no longer black specs on maps and continents are not just pages on a book...the world becomes an inhabited planet instead of a coloured globe on the teacher’s desk.”<sup>71</sup> As a result of Ford’s continued innovation the sales of his Model T began to steadily grow. In 1910, Ford produced around 19,050 Model Ts, but by 1923, his company produced just over two million. The Model T’s price also continued to decline and for the first time went below the national average wage at \$575.<sup>72</sup>

Ford’s assembly line completely shifted the way cars were made in America, and his focus on efficiency inspired his Detroit based competitors such as General Motors (GM). In order to remain relevant, GM retooled their production and this transformed Detroit into an economic giant. Even though Europe started the development of the automobile, by the 1920s they were being left behind. On average, it took French workers three hundred days to finish a single car. However, GM and Ford were able to complete the same task in only seventy days.<sup>73</sup> The proliferation of automobiles completely shifted the way people interacted with each other, and created a new subculture of automotive enthusiasts.

As the availability of the automobile became widespread, it did not take long before owners began to modify their cars for increased speed and performance. According to H.F. Moorhouse, the beginnings of hot rod culture in America spawned in the 1920s around the dry

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<sup>70</sup> Guillermo Giucci, *The Cultural Life of the Automobile: Roads to Modernity* (Austin: University of Texas Press, 2012), 12.

<sup>71</sup> Henry Ford, *Henry Ford My Life and Work* (Luxembourg: CreateSpace Independent Publishing Platform, 2013), 127.

<sup>72</sup> Parissien, *The Life of the Automobile*, 14-15; and Tony Swan, “Ford’s Assembly Line Turns 100.”

<sup>73</sup> Parissien, *The Life of the Automobile*, 16-17.

lakebeds in Southern California.<sup>74</sup> William Carroll notes that California also attracted hot rodders because of the consistent good weather. Cars during this time were often configured with an open top design; so, access to suitable weather was an important issue.<sup>75</sup> These areas allowed drivers the chance to really test the performance of their cars with some lakes spanning twenty-two miles.<sup>76</sup> Along with the favorable terrain, the availability of used cars allowed just about anyone to join as a novice enthusiast.

Ford produced so many Model T's and Model A's that the price for a used model drastically dropped to where almost any American could afford a set of wheels. Hot rod culture heavily benefited from the industrial capacity of Detroit industry. Carroll points out that in 1928 a used Model A could be purchased for around \$50, and since Ford made close to 4 million by the end of its production in 1932, there were plenty of spare parts for hot rodders.<sup>77</sup> This is a crucial piece in the development of hot rod culture because testing and racing breaks parts. The whole idea of racing is to beat the other competitors, and so racers often overstress and push parts to the limit. Carroll breaks down the financial investment for hot rodders in 1932, and it only took around \$400 to make a competitive car. Even for 1932, this was still a reasonable price as the average weekly wages for manufacturing workers was around \$70.<sup>78</sup> This allowed enthusiasts to continue their endeavor for speed even through the Great Depression. For

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<sup>74</sup> H.F. Moorhouse, *Driving Ambitions: An Analysis of the American Hot Rod Enthusiasm* (New York: Manchester University Press, 1991), 26.

<sup>75</sup> William Carroll, *When the Hot Rods Ran* (San Marcos, CA: Auto Book Press, 1991), 6.

<sup>76</sup> Moorhouse, *Driving Ambitions*, 26-27.

<sup>77</sup> Carroll, *When the Hot Rods Ran*, 6; and Kurt Ernst, "This Day in History, 1927: Ford reveals its Model A to an eager public," *Hemmings Daily: The World's Leading Classic Car News Source*, December 2, 2013, accessed on March 25, 2017, <https://www.hemmings.com/blog/2013/12/02/this-day-in-history-1927-ford-reveals-its-model-a-to-an-eager-public/>.

<sup>78</sup> Carroll, *When the Hot Rods Ran*, 6; and "Wages, Hours of Labor, and Employment," *United States Census Bureau*, accessed on March 25, 2017, <https://www2.census.gov/library/publications/1938/compendia/statab/59ed/1937-13.pdf>.

example, internal engine parts such as a connecting rod could be replaced for around \$8.<sup>79</sup> Also, being able to cheaply test parts allowed innovation in order to develop better parts.

Drivers tried to tune and modify their cars in order to gain more speed. As a result, some of the earliest speed shops opened up in southern California. These shops encouraged the technical development of hot rod culture. Producing a faster car in the 1920s and 1930s was a primitive yet arduous task. Drivers could not just order new parts from a store or dealership. It was up to the owner to design and test new parts. This spawned a culture that encouraged resourcefulness. According to Michael Dobrin, the Great Depression contributed to developing the resourcefulness among hot rodders. During the 1930s, few adolescents could hardly afford a new car, and so the junkyard became their source of parts.<sup>80</sup> Charles Scott recounts his experience with the resourcefulness hot rodding in the early 1930s. Two of his friends George Whit and Lee Chappel would scavenge for parts in the junkyard in order to sell or modify their own cars. For Scott, he stripped down his mother's old Chevrolet, and transplanted a Olsmobile engine in order to increase power.<sup>81</sup>

While a majority of hot rodders modified production vehicles, at times there would be complete hodgepodge cars purposefully built for speed. A hot rodder named Johnny Junkin built a car known as the Pierce Arrow. This car was powered by a straight eight engines, but used a Ford rear end. Also, the brakes were taken from a Plymouth and the seatbelts were stripped from an airplane. Jenkins raced his creation at Muroc Dry Lake, California and reached 114mph.<sup>82</sup>

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<sup>79</sup> Kevin Hoag and Brian Dondlinger, *Vehicular Engine Design* (New York: Springer, 2015); and Carroll, *When the Hot Rods Ran*. 1-15.

<sup>80</sup> Michael Dobrin and Philip E. Linhares, *Hot Rods and Customs: The Men and Machines of California's Car Culture* (Oakland: Oakland Museum of California, 1996), 20.

<sup>81</sup> Ibid.

<sup>82</sup> Carroll, *When the Hot Rods Ran*, 14.

While Jenkins did not work with Carroll Shelby, this type of ingenuity proved vital to his success later on as a builder and team owner throughout his career as he would pull from these sources to develop his company Shelby American.

These races initially operated like the old west; there was no local organization; and participants were given complete freedom to drive and race anything they wanted. While this freedom pushed performance, it also resulted in accidents and deaths as drivers would race at night to add further adrenaline to their sport. However, as more drivers and spectators came out it became necessary to develop some type of organized body. This started out organically with drivers forming their own clubs known as Road Runners, Gophers, and Gear Grinders.<sup>83</sup> These clubs were oftentimes open to all enthusiasts but some were based on race including the Centuries who were an all-black group.<sup>84</sup> Along with creating their own clubs, they also developed their own lingo. Hot rodders called their creations “gow jobs” or “soup ups”. These terms referred to the style of car used at the lakes in Southern California during the 1930s. A “gow job” was a car that had everything removed expect for the essentials. This style quickly became a standard among California hot rodders and helped to distinguish their culture from everyone else. There was little chance of mistaking one of these loud modified machines.<sup>85</sup> As the clubs and groups began to expand over the 1930s, they also began to reorganize into larger conglomerates.

These early clubs tried to encourage more competition and comradely between each other, and the first organized race was at Muroc. The Gilmore Oil Company sponsored the event

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<sup>83</sup> Moorhouse, *Driving Ambitions*, 26-27.

<sup>84</sup> Ibid.

<sup>85</sup> “From Gow Job to Hot Rod,” *California Agriculture Museum*, accessed March 26, 2017, <https://heidrickaghistorycenter.wordpress.com/2014/03/25/from-gow-job-to-hot-rod/>; and Dobrin, *Hot Rods and Customs*, 22.



and charged drivers \$1 to enter their car. These events helped to bring clubs together, and they began to create speed record clubs, which anyone could attempt to join. One of the first speed clubs was the 100-mile-an-hour group. In order to join this club, a driver needed to surpass 100-mph during a single pass. If they achieved this goal, they were given a shirt with the club's name.<sup>86</sup> Once the clubs began to grow, they continued to build into larger governing bodies.

By 1937, the Southern California Timing Association (SCTA) was formed and became one of the most prominent clubs in Southern California. The primary goal of this group was to organize races that promoted a safe place for competitors and spectators. Another goal was to reshape the image of the hot rodders in the hopes they could better their relationship with the public. Hot rodders would oftentimes shutdown roads and drag race all night and this public disturbance, along with their loud cars, developed a negative image among many in California.<sup>87</sup> In order to better their relation among the community, Moorhouse notes some of the key rules the organization implemented including: safety regulations, safety inspections, track inspections, single car racing, and law enforcement compliancy.<sup>88</sup> These efforts to improve the safety demonstrate the complexity of hot rod culture.

For example, in the 1930's single car racing was implemented in an effort to drastically reduce danger, which surrounded racing on a dry lakebed. Instead of directly driving against another driver, they would be set against the clock. This allowed time for dust to settle between runs, so drivers could clearly see the track before them.<sup>89</sup> These changes helped to reduce the danger and helped to attract new hot rodders to the group. The culture surrounding hot rods was

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<sup>86</sup> Carroll, *When the Hot Rods Ran*, 6.

<sup>87</sup> Dobrin, *Hot Rods and Customs*, 22-23.

<sup>88</sup> Moorhouse, *Driving Ambitions*, 27.

<sup>89</sup> *Ibid.*

much more than a hobby or strictly for enthusiasts. While on the outskirts of mainstream culture, California hot rodders were looking for ways to legitimize their own group and develop a type of standard. While the natural progression of hot rod culture is seen over the course of the 1920s and 1930s, the biggest leap in innovation would be seen after World War II.

When America entered the war in late 1941, the industrial might of the United States began to solely focus on defeating the Axis powers. Frank Hill breaks down the contribution of the auto industry towards the war effort, which included the largest manufacturers Ford, GM, Chrysler, Packard, and Willys.<sup>90</sup> The American auto industry devoted its energy towards the war effort and from February 1942 to October 1945 did not produce a single new car. According to John Buescher, the Office of Production Management halted the sale and construction of new cars and auto parts for consumers.<sup>91</sup> Their combined effort created a massive industrial complex that could out produce any nation, and by the end of the war they had produced fifty-seven percent of the tanks, fifty-six percent of the carbines, and ten percent of the airplanes used in the war. Henry Ford was so devoted to the cause that he built a plant in Willow Run dedicated to the production of airplanes.<sup>92</sup> General Motors also worked on a variety of projects including Pratt and Whitney engines and by the end of war had completed 60,000 units. Auto manufacturers also produced millions of munitions by the end of the war with GM recording 8 million artillery shells shipped by 1945.<sup>93</sup> While automotive industry design and technology for consumers did

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<sup>90</sup> Frank Ernest Hill, *The Automobile: How It Came, Grew, and Has Changed Our Lives* (New York: Dodd, Mead & Company, 1967), 147.

<sup>91</sup> John Buescher, "The Auto Industry Goes To War," *Teaching History*, accessed March 26, 2017, <http://teachinghistory.org/history-content/ask-a-historian/24088>.

<sup>92</sup> Hill, *The Automobile: How It Came, Grew, and Has Changed Our Lives*, 147-148.

<sup>93</sup> "No New Cars, but That Didn't Stop U.S. Automakers, Dealers During WWII", *Automotive News*, accessed March 26, 2017, <http://www.autonews.com/article/20111031/CHEVY100/310319970/no-new-cars-but-that-didnt-stop-u.s.-automakers-dealers-during-wwii>.

not advance over the war, the absence of new cars created a huge demand after the war ended.

During the war, the automotive industry promoted the idea of conservation to help support the war effort. According to Jesse Snyder, General Motors developed the motto, “service to survive.” The aim was to encourage customers to consistently service their vehicles so that it would help extend the life of their vehicle.<sup>94</sup> The war effort created a unique situation for local dealers. Since they could not sell new cars, they had to develop different ways to stay open. For example, the McEleney Brothers in Clinton, Iowa transformed their showroom into a bowling alley.<sup>95</sup> This example has little impact on the development of Detroit industry, but it demonstrates the level of conservation for Americans and dealers across America. The war forced Americans to limit themselves and once Detroit started producing cars, again it found a new market that was ready to spend. World War II not only transformed the automotive industry, but also some California hot rodders who received an extensive education in mechanical engineering, which they would then apply to their own cars once the war ended.

Young California hot rodders heard the call to serve just as any other young men across the country in 1941. The lakebed racing across the state dried up as men were shipped to boot camp and then overseas to fight. Michael Dobrin suggests that as these young men traveled around America and the rest of the world, they took pictures of their cars and shared them with anyone who would listen.<sup>96</sup> This helped to spread the subculture of hot rodding to other like-minded individuals. Furthermore, GIs and Marines bound for the Pacific often shipped from Southern California and would have witnessed the hot rod culture.<sup>97</sup> Some service members

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<sup>94</sup> Ibid.

<sup>95</sup> Ibid.

<sup>96</sup> Dobrin, *Hot Rods and Customs*, 22-23.

<sup>97</sup> Ibid., 22-23.

spent time on the dried up lakebeds as such as Lake Muroc, which was transformed into a runway and training facility for pilots. According to William Carroll, the Army Air Force took over the land in 1938, and at first, the hot rodders were reluctant to leave and continued to race, but as more soldiers arrived, they realized they were out gunned. After the Army took control the military sketched the perimeter of a battleship on the floor of the lakebed, so that pilots could train how to bomb enemy ships.<sup>98</sup> As war became inevitable, some of the hot rodders would return to Lake Muroc, but this time they were working on airplane engines instead of cars.

California hot rodders were an important asset to the American government and overall war effort. These young men were well versed in building cars and figuring out how to make them faster. Eric Braun notes once they joined the military, instead of building a car's engine, they worked on a variety of aircraft from B-24s to P-51s. Along with applying their mechanical knowledge of engines to the war effort, they expanded their mechanical knowledge by working as mechanics.<sup>99</sup> Hot rodders who served as mechanics in the Army Air Force received specialized training, and in 1942, every service member who completed the generalized training course was sent to factories in order to learn the ins and outs of their aircraft. Furthermore, the Army Air Force gave out around 700,000 technical degrees from 1939 to 1945, and while some earned more than one degree, this number demonstrates the quantity of highly trained and skilled mechanics.<sup>100</sup> Oftentimes hot rodders were able to continue their automotive passion as General Curtis LeMay set up sever Hobby Shops for airmen and military personnel to use for their own projects. The war introduced thousands of Americans to the culture of motorization and once the

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<sup>98</sup> Carroll, *When the Hot Rods Ran*, 15.

<sup>99</sup> Eric Braun, *Hot Rods* (Minneapolis: Lerner Publications Company, 2007), 14.

<sup>100</sup> W.F. Craven and J.L. Cate, ed., *The Army Air Forces in World War II Men and Planes* (Washington, D.C.: Office of Air Force History, 1983), 505-8.

war ended many looked towards cars and the auto industry to fulfill their need for a career and speed.<sup>101</sup>

After World War II the automotive industry needed to catch up as no new cars were produced during the course of the war. In fact, in 1946 and 1947 GM refitted their 1942 models with new grills and accessories in order to keep up with demand. However, by 1950, the market and Detroit industry were ready for a change and new era of hot rod culture emerged but Detroit often ignored their desires.<sup>102</sup> The automotive industry wanted to reach the mass market and hot rodding was still trying to define itself within American culture. Therefore, Detroit built postwar cars to fit the needs of new buyers and not specifically hot rodding. Instead of building lighter cars with more power, Detroit introduced electric windows and power steering. These options are of little concern for the average hot rodder, but the average American expected these types of comforts and options.<sup>103</sup> After the war, ended former hot rodders returned and often picked up right where they left off. Stu Hilborn bought his hot rod on December 7, 1941, but left his project car behind as he joined the war effort. However, when he got out of the military he immediately transplanted a Ford flathead V8 into the body.<sup>104</sup>

The rebound of the America economy after the war greatly benefited the hot rod and automotive community. In 1947, *Fortune* found that discretionary income had risen by 160% and more Americans than ever spent this surplus on cars. For example, Americans registered

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<sup>101</sup> Warren Kozak, *LeMay: The Life and Wars of General Curtis LeMay* (Washington, D.C.: Regnery Publishing, Inc., 2009), 298-299.

<sup>102</sup> "No New Cars, but That Didn't Stop U.S. Automakers, Dealers During WWII."

<sup>103</sup> Marc Davis, "How the U.S. Automobile Industry Has Changed," *Investopedia*, accessed on April 11, 2017, <http://www.investopedia.com/articles/pf/12/auto-industry.asp>.

<sup>104</sup> Larry Chen and Wes Allison, "The History of Hot Rodding 1940s and 1950s," *Hot Rod Network*, last updated August 22, 2013, accessed on April 11, 2017, <http://www.hotrod.com/articles/history-of-hot-rodding-1940s-1950s/>.

forty-five million new cars between 1947 and 1955.<sup>105</sup> It seemed everyone in America was buying cars including teenagers, and by 1958, 1.5 million owned their own cars. As a result of this automotive boom, the hot rod culture found a new source for enthusiasts and relied on magazines to reach them. Several magazines began printing on hot rods during this time including *Road and Track*, *Motor Trend*, and *Hot Rod*. The term “hot rod” became a household name, and by 1956, the *Hot Rod* magazine sold half a million copies per month.<sup>106</sup> Along with reading magazines, the hot rod culture was spending money modifying their cars and racing them at their local track.

Unlike before World War II, hot rodding was not solely limited to Southern California, and now Americans from all over the country were participating in the culture. Also, the amount of available cash greatly increased the quality of hot rodding and by 1952, *Business Week* estimated that hot rodders spent close to \$50 million that year alone on parts.<sup>107</sup> Clubs were no longer restricted to Southern California and in 1951, the National Hot Rod Association (NHRA) became one of the first national hot rod governing bodies. This organization acted a lot like its predecessors in that it created standards and worked to create better relationships with the local communities.<sup>108</sup> The military also continued to help the hot rod culture grow as General Curtis Lemay partnered with the Sports Car Club of America (SCCA) to sponsor races. The SCCA was allowed to use the airstrips and by doing this Lemay hoped to create a sense of competition among his personnel and the community surrounding the bases. Ultimately, this helped to establish a foundation that allowed hot rodding to grow beyond just stripped out cars, and

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<sup>105</sup> Moorhouse, *Driving Ambitions*, 71-72.

<sup>106</sup> *Ibid.*, 71-73.

<sup>107</sup> *Ibid.*, 71-76.

<sup>108</sup> Wally Parks, *The Fast Lane: The History of NHRA Drag Racing* (New York: Regan Books, 2001), 14-

develop into an organized competitive sport.<sup>109</sup>

While Detroit industry and hot rod culture spread throughout the 1950s, there was little interaction between the two groups. General Motors in part tried to reach these groups through the development of the Chevrolet Corvette, but the hot rod community looked within to define and build their own unique creations.<sup>110</sup> However, by the 1960s Shelby would come along and use his influence within both cultures to not only create some of the most iconic cars including the Cobra, but also win world championships with the GT40. For Shelby the 1950s were the foundational years and throughout his career, he would work to combine Detroit industry and hot rod culture to develop the Cobra, GT40 and Mustang GT350.

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<sup>109</sup> Jeremy R. Kinney, "Racing on Runways," *Sports and Leisure* 19 (2013): 194-195.

<sup>110</sup> Andrew Wendler and Kevin Wilson, "Chevrolet Corvette Timeline: Milestones and More from C1 and C7", *Car and Driver*, last updated July 24, 2013, accessed March 26, 2017, <http://blog.caranddriver.com/chevrolet-corvette-timeline-milestones-and-more-from-c1-through-c7/>.

## Chapter 2: Shelby's Racing Years

Oftentimes Carroll Shelby is known for the creation of the Cobra in 1962 or his influence on the Mustang, but neither of these projects could have succeeded without Shelby's racing experience to back up his vision. Shelby's career as a racing driver started a bit different from his contemporaries. After World War II, Shelby settled into civilian life near Dallas, Texas and started expanding his family. By November 1946, Shelby and his wife were pregnant with their second child, Michael, and auto racing was not on the radar; instead, he focused on providing for his family. After leaving the military, he had few skills other than flying, and according to historian Brian Laban, Shelby was ready to move beyond aviation.<sup>111</sup> He accepted Bailey Gordon's offer to drive concrete trucks for local construction projects, and he achieved some financial success while doing this. For every load, he was paid \$2.00, and according to Gordon, the drivers could complete a single trip in about 25-30 minutes. Also, based on Gordon's calculations a driver in 1946 needed to make \$3.50 hour to be profitable, which Shelby accomplished.<sup>112</sup> However, average was never enough for Shelby and he strived to grow the trucking business.

Shelby convinced W.W. Caruth, a local businessman, to invest in the company by purchasing six old GMC World War II troop carriers and converting them into cement mixers.<sup>113</sup> While more trucks equaled higher dividends, the problem was the terrain beat their equipment up beyond its intended use, and they could not afford to keep fixing them. According to Gordon, the rough ground near the delivery areas wore the tires out sooner than expected and since

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<sup>111</sup> Brian Laban, *AC Cobra: The Complete Story* (Ramsbury, Marlborough: The Crowood Press, 2006), 17.

<sup>112</sup> Mills, *Carroll Shelby: The Authorized Biography*, 29.

<sup>113</sup> *Ibid.*, 28.



contractors only earned 62 cents per mile the company could not afford to maintain their vehicles.<sup>114</sup> Furthermore, Shelby personally over extended himself on his rent at \$75 per month, and instead of taking money from his father-in-law Shelby strove to find his own way through life. However, the trucking company could not make enough to support Shelby and his family. As a result, he always fought for every cent Gordon collected from their contractors. So, instead of saving money and reinvesting into the company, they always broke even. Gordon began to hide money from Shelby so they he could continue to pay their bills.<sup>115</sup> Also according to Shelby, the housing boom started to slow and there was no longer the means to earn a substantial living in the trucking business.<sup>116</sup> After the trucking company failed, Shelby turned to his father-in-law in hopes of turning his fortune around.

By 1947, Shelby and his wife had their third child, and in order to meet the needs of his growing family, he began working in the oilfields for his father-in-law's company. According to Rinsey Mills, Shelby was unable to meet the expectations of Mr. Fields. Even after Shelby joined one of his oil crews, Fields expected him to work his way up through the ranks. Shelby stated, "My father-in-law thought that if I worked for about 15 years in the oilfields then that might be enough time for him to decide that I could go into the family business."<sup>117</sup> This statement might be interpreted as an example of Shelby's unwillingness to work hard or get dirty, but it is important to examine some of his past jobs. While stationed at Randolph Airfield during World War II, he initially shoveled manure; so, Shelby had experience doing dirty and difficult jobs.<sup>118</sup>

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<sup>114</sup> Ibid.

<sup>115</sup> Ibid.

<sup>116</sup> Carroll Shelby, *The Cobra Story* (Minneapolis, MN: Motorbooks, 1965), 32.

<sup>117</sup> Carroll Shelby in Mills, *Carroll Shelby: The Authorized Biography*, 30.

<sup>118</sup> Shelby, *The Cobra Story*, 20.

The issue for Shelby was the disdain he felt working for someone else. He stated, “I tried it and it didn’t work. I can’t work for anybody.”<sup>119</sup> This desire for self-sufficiency motivated Shelby to operate his own business, this time raising chickens.

After leaving the oilfields, Shelby had few resources, but through each endeavor, he developed relationships that he used to accomplish his own dreams. In order to start raising chickens, Shelby borrowed land from W.W. Carruth, who he worked under while delivering concrete.<sup>120</sup> Shelby settled on a small portion of Carruth’s land in East Texas, and procured a loan from the Small Business Administration. Initially Shelby experienced some success and sold a couple thousand chickens. However, by 1950 the company completely went under as all of his chickens contracted Newcastle disease.<sup>121</sup> At time of the outbreak, Shelby had close to 35,000 chickens, but over half died due to the disease.<sup>122</sup> According to Shelby, in just a couple days he lost close to 20,000 chickens, and it completely bankrupted his venture.<sup>123</sup> This confused Shelby because he specifically paid to vaccinate his chickens from this disease. Shelby suspected foul play, but during his investigation, he found out the feed supplier failed to apply the correct chemicals to protect them from Newcastle, so it was only a matter of time before they contracted

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<sup>119</sup> Mills, *Carroll Shelby: The Authorized Biography*, 30.

<sup>120</sup> *Ibid.*, 32.

<sup>121</sup> Newcastle disease is a highly contagious viral disease that affects domestic poultry, which in extreme cases has a 100% death rate. Once the virus infects its host, it generally manifests itself within two to five days. The virus interrupts a chickens digestive, respiratory, and nervous systems. Chickens affected by Newcastle experience a drop in egg production, diarrhea, and twisted necks. “Newcastle Disease,” Agriculture Victoria, accessed January 14, 2017, <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/animal-diseases/poultry/newcastle-disease>.

<sup>122</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 8.

<sup>123</sup> Shelby, *The Cobra Story*, 34.

the deadly illness.<sup>124</sup> Shelby's business could not recover and so he sold off everything and continued to pay off his loans until 1965.<sup>125</sup>

While engaging different business ventures failed, Shelby never completely lost interest in cars, and by 1950 he began to move towards automotive sports. Even during his time as a cement driver Shelby demonstrated an interest in racing. Gordon remembers Shelby often interacting with the mechanics who worked on company vehicles. Shelby and the mechanics would race their 1934 Fords, which had everything removed except for the body and seat.<sup>126</sup> Furthermore, even as Shelby worked for his father-in-law's oil company, he continued to cultivate an interest in auto racing. Shelby defined it as, "The embers of my enthusiasm for automobiles were still smoldering awaiting, and it seemed the right moment to flare up."<sup>127</sup> It was here Shelby interacted with the hot rod culture. According to historian Trevor Blank, hot rodding initially developed after World War II on the dry lakebeds in Southern California and then spread east.<sup>128</sup> Out at Love Field, Shelby and a group of Braniff Airline pilots started the Dallas Micro Midge Race Car Club. The club modeled their vehicle rules specifications on established racing clubs in California. "Cully" Cullwell started the group and required all car motors to be limited to 30 cubic inches. Once they completed their cars, the group built a small oval track in an industrial park near Irving, Texas.<sup>129</sup> While the drivers wanted to win, they often participated solely for the competition of racing. For Shelby, these were the first steps towards a

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<sup>124</sup> Mills, *Carroll Shelby: The Authorized Biography*, 32-33.

<sup>125</sup> Shelby in Mills, *Carroll Shelby: The Authorized Biography*, 33.

<sup>126</sup> Mills, *Carroll Shelby: The Authorized Biography*, 29.

<sup>127</sup> Shelby, *The Cobra Story*, 34.

<sup>128</sup> Gina Misiroglu, ed., *American Countercultures: An Encyclopedia of Nonconformists, Alternative Lifestyles, and Radical Ideas in U.S. History* (England: Routledge, 2008), 183.

<sup>129</sup> Mills, *Carroll Shelby: The Authorized Biography*, 32.

career in professional motorsports.

Shelby continued to participate in local events in Texas, and often drove Ed Wilkins's ladder-framed racecar known as "The Monster", which was powered by a Ford flathead V8.<sup>130</sup> Brian Laban notes the importance of Shelby's relationship with Wilkins. The pair attended school together, and Shelby greatly benefited from working with Wilkins. In January 1952, Wilkins helped Shelby win his first official recorded race while driving "The Monster" at Grand Prairie Naval Station near Dallas.<sup>131</sup> Behind the wheel of Wilkins homebuilt, drag car Shelby easily outmatched his competition, which mainly consisted of European sports cars. This win not only added credibility to Shelby's driving record, but immersed him into the culture of hot rodding. For hot rodders, the name of the game is speed, and they strive to make their cars just a little faster. Wilkins, with help from Shelby's residential home garage, applied this philosophy to the Monster, by replacing the Ford motor with a Chrysler.<sup>132</sup>

For his next race, Wilkins provided his personal 1949 MG TC, which Shelby first drove and won at a circuit race in Norman, Oklahoma.<sup>133</sup> The Sports Car Club of America (SCCA) hosted this race, which was the only organization in America to sponsor serious racing.<sup>134</sup> During the first event, Shelby raced against other MGs and was able to work his way up to finish in first place. While this race was impressive, it was Shelby's next race that demonstrated his ability to

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<sup>130</sup> Ibid., 36.

<sup>131</sup> Brian Laban, *Shelby and the AC Cobra* (UK: Crowood, 2015), 15.

<sup>132</sup> Shelby, *The Cobra Story*, 35-39.

<sup>133</sup> MG-TC was a British sports car that was a popular choice for hot rodders and profession racers during the 1950s. From the factory, it was equipped with a 1,250 cc motor, which was rated around 54-horse power. An engine's cc is defined by the volume of the engine cylinders, therefore the larger the cc the bigger the engine. While not an enormous amount of power, the MG-TC only weighed 1,822 pounds, (which in racing performance is defined by a vehicle's power to weight ratio.) Laban, *Shelby and the AC Cobra*, 15. "1947 MG TC", *Automobile Catalog*, accessed on May 3, 2017, [http://www.automobile-catalog.com/make/mg/tc\\_mg/tc\\_midget/1947.html](http://www.automobile-catalog.com/make/mg/tc_mg/tc_midget/1947.html).

<sup>134</sup> Laban, *Shelby and the AC Cobra*, 16.

drive against cars that were more powerful.<sup>135</sup> Shelby's win in an MG TC, which was underpowered compared to his competitor's Jaguar Xk-120, got the attention of other team owners. According to historian Wallace Wyss, Shelby did not win because he was a better driver, but because of his unique style of driving. Wyss notes automotive racing was a gentleman's sport. At this time however, Shelby did not meet the mold of a typical professional driver. For example, he cut other drivers off at corners and did not hesitate to bump other cars.<sup>136</sup> This difference in pedigree only highlights the importance of Wilkins' relationship with Shelby. Automotive racing is an expensive sport and according to the U.S. Department of Commerce the average American worker in 1950 made \$3,319 per year.<sup>137</sup> It was difficult for Shelby in 1952 to afford his passion for racing when he had three kids at home. Further, even though by the end of 1952 he had won four races, he still did not receive a single cent for his work.<sup>138</sup> Despite this, Shelby's efforts had set the stage for a more lucrative career in auto racing.

Shelby's ability to drive caught the eye of Charlie Brown, who built his wealth from operating paper mills in Louisiana. Brown asked Shelby to drive his Cadillac powered Allard J2 at Sowega, Georgia. This was a two-event race starting out with twelve laps around a 4 ½ mile track and then a four-hour strategic air power race. While Shelby placed 4<sup>th</sup> and 12<sup>th</sup> respectively, the importance of this race demonstrates the relationship that developed after World War II between racing and military veterans.<sup>139</sup> General Curtis LeMay sponsored the strategic air race

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<sup>135</sup> Shelby, *The Cobra Story*, 36.

<sup>136</sup> Wyss, *Shelby: The Man. The Cars. The Legend*. 8.

<sup>137</sup> U.S. Department of Commerce, Bureau of the Census, "Current Population Reports, Series P-60, Money In- come of Families and Persons in the United States," accessed January 14, 2017, <https://nces.ed.gov/pubs98/yi/yi16.pdf>.

<sup>138</sup> Shelby, *The Cobra Story*, 39.

<sup>139</sup> Mills, *Carroll Shelby: The Authorized Biography*, 39.

and allowed the SCCA to host events on retired and active airbases.<sup>140</sup> LeMay would often participate in the events driving a Cadillac-Allard, while smoking a cigar and sporting a World War II Army Air Force pilot's helmet.<sup>141</sup> Automotive racing attracted pilots because, just like flying, racing cars tested your ability and not everyone could pilot a vehicle to its limits.<sup>142</sup> Furthermore, even though Shelby did not win every race his reputation continued to grow among those who could afford to sponsor drivers such as Roy Cherryhomes in 1953.<sup>143</sup>

Shelby's career took a giant step forward when he developed a relationship with Cherryhomes. Cherryhomes made his money in the oil business and spent his time personally racing and sponsoring drivers.<sup>144</sup> While willing to sponsor other drivers, Cherryhomes did not hesitate to drop a driver who underperformed, and the only way for Shelby to remain on the team was to win.<sup>145</sup> Shelby piloted Cherryhomes's Cadillac-Allard to nine wins, including one at Eagle Mountain in Texas where he appeared in his legendary striped overalls. Since the SCCA actually prohibited drivers from receiving any type of monetary compensation, and often suspended those caught receiving compensation, Shelby had to farm in order to provide for his family.<sup>146</sup> Prior to the Eagle Mountain National Guard airbase race in August 1953, Shelby

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<sup>140</sup> Laban, *Shelby and the AC Cobra*, 17. General Curtis LeMay was one of the main leaders of the Allied bombing raids during World War II. LeMay continued in his career in the military and eventually supervised the Berlin airlift in 1948.

<sup>141</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 9.

<sup>142</sup> Motor Trend, *Shelby: A Tribute to An American Original* (Minneapolis, MN: Motorbooks, 2012), 14.

<sup>143</sup> Mills, *Carroll Shelby: The Authorized Biography*, 41.

<sup>144</sup> *Ibid.*, 41-44.

<sup>145</sup> Shelby, *The Cobra Story*, 43.

<sup>146</sup> Mills, *Carroll Shelby: The Authorized Biography*, 44-46.

decided to drive in his work overalls instead of the typical attire.<sup>147</sup> Initially the other drivers teased Shelby, but after winning the race, he received more attention for his wardrobe than anyone else, and opted to continue racing in his overall in future events.<sup>148</sup> After the race Shelby stated, “Hey, if the press likes the angle of a fast driving farmer, then they get one.”<sup>149</sup> This image set Shelby apart from the rest of his competition, and established a unique persona. Shelby’s trademark look and driving ability helped him secure a place to represent the United States at the Buenos Aires 1,000 km Sports Car Grand Prix in 1954.<sup>150</sup>

For this race, Cherryhomes paid the financial expenses for Shelby and Dale Duncan to pilot his Cadillac-Allard. Unfortunately, Shelby and Duncan were unable to win this race, and ended up finishing in 10<sup>th</sup> place, but they did win the Kimberley Cup.<sup>151</sup> Shelby stated winning the Kimberly Cup was the turning point in his career.<sup>152</sup> This award was specifically set up by local Argentinian drivers to compete against the four Americans. Furthermore, Duncan and Shelby were plagued with mechanical failures, and their Allard had several blowouts and even caught fire, which Duncan extinguished. Jim Mourning wrote in *Modern Men* magazine, “Shelby nursed the ailing Allard for the last 60 miles...”<sup>153</sup> Things could have ended much worse as there were several accidents during the race, one that took the life of Eric Greene who rolled his DB3

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<sup>147</sup> Motor Trend, *Shelby: A Tribute to An American Original*, 14.

<sup>148</sup> Carroll Shelby, *The Cobra Story*, 44-45; and Shav Glick, “Heart of a Gambler: Carroll Shelby Designs a Car to Pump Life Into American Racing,” *Los Angeles Times*, March 24, 1991.

<sup>149</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 10.

<sup>150</sup> Mills, *Carroll Shelby: The Authorized Biography*, 47.

<sup>151</sup> Carroll Shelby, *The Cobra Story*, 48; and Alan Henry, “Obituary: Carroll Shelby: US Racing Driver and Engineer Behind the Classic Cobra Sports Car,” *The Guardian*, July 12, 2012, 32.

<sup>152</sup> Art Evans, *Carroll Shelby: A Collection of My Favorite Racing Photos* (Forest Lake, MN: CarTech, 2016), 36.

<sup>153</sup> Wyss, *Shelby: The Man. The Cars. The Legend*. 13.

Aston Martin.<sup>154</sup> However, this race was a part of the FIA's World Sports Car Championship, which brought Shelby into contact with some of the world's leading teams and drivers including Farina, Schell, Behra, and Portago. Also represented were major European manufacturers such as Ferrari and Aston Martin.<sup>155</sup>

During the 1950s, racing culture was just as much concerned with socializing as it was racing. The schedule listed for the Palm Springs race had drivers meeting at dinners and cocktail parties.<sup>156</sup> According to Mills, socializing was an important aspect of automotive racing. Even though they were competitors, drivers often drank and gathered together. Shelby met with an Aston Martin driver named Peter Collins who introduced Shelby to the racing director for Aston Martin, John Wyer. Laban remarks that Shelby's persona impressed Wyer, and he offered Shelby the chance to drive for Aston Martin at Sebring, Florida in March 1954.<sup>157</sup>

The course at Sebring was located at Hendricks Field, which during World War II operated as a bomber base. After the war, Alec Ulman repurposed the property into a racetrack and today Sebring is considered the first and oldest European-style endurance race in America.<sup>158</sup> The first six-hour event was held on New Year's Eve 1950, but quickly transformed into a formidable and prestigious race, second only to Le Mans.<sup>159</sup> For Shelby to represent Aston Martin at Sebring was an enormous achievement for an amateur racing driver. In March 1954,

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<sup>154</sup> Mills, *Carroll Shelby: The Authorized Biography*, 48.

<sup>155</sup> Laban, *Shelby and the AC Cobra*, 17.

<sup>156</sup> Michael T. Lynch, William Edgar, and Ron Parravano, *American Sports Car Racing in the 1950s* (Osceola, WI: MBI Publishing Company, 1998), 142.

<sup>157</sup> Laban, *Shelby and the AC Cobra*, 18.

<sup>158</sup> Pete Lyons, "Sebring History: Truth in 12 Inspired by Le Mans, America's Sports Car Classic Has A Flavor and History All Its Own," *Road & Track*, February 15, 2011, accessed January 14, 2017, <http://www.roadandtrack.com/motorsports/news/a16940/sebring-history-truth-in-12/>.

<sup>159</sup> Laban, *Shelby and the AC Cobra*, 18.



Aston Martin paired Shelby with Charles Wallace, but unfortunately, their DB3S's brakes began to overheat. As Shelby came in to switch drivers, the crew tried to salvage the cars, but not soon after Wallace took control the car's axle bearings broke down, which ended their bid at Sebring.<sup>160</sup>

While mechanical failures are a part of racing, the opportunity proved Shelby could race and be competitive; so, after the race Wyer offered Shelby the opportunity to race in Europe at Le Mans so long as he paid his own way.<sup>161</sup> He sent Shelby a Western Union Telegram in April that stated, "ARRAAGEMENTS MADE FOR YOU TO DRIVE AT LE MANS STOP LEGGERR FOLLOWS AIRMAIL = WYER."<sup>162</sup> Along with the encouragement of his wife, Shelby decided to race in Europe and take the chance to prove he could race at the legendary Le Mans, which challenges drivers and cars to compete for 24 hours of continuous racing.<sup>163</sup> However, before Wyer would sponsor Shelby at Le Mans, he needed to race against Europe's best drivers.

Wyer brought Shelby to Europe in April 1954, and placed him in a DBS3. Shelby's first official European race occurred at Aintree near Liverpool. According to Mills, Shelby not only had to overcome expert drivers, such as Duncan Hamilton who won at Le Mans the year prior, but also the weather. From the start of the race, the rain poured, but unlike the other American drivers, it did not faze Shelby.<sup>164</sup> Mills and other historians do not comment on his ability to handle the weather, but based on his flying experience during World War II Shelby was often

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<sup>160</sup> Mills, *Carroll Shelby: The Authorized Biography*, 49.

<sup>161</sup> Motor Trend, *Shelby: A Tribute to An American Original*, 14.

<sup>162</sup> Mills, *Carroll Shelby: The Authorized Biography*, 50.

<sup>163</sup> Laban, *AC Cobra: The Complete Story*, 19.

<sup>164</sup> Mills, *Carroll Shelby: The Authorized Biography*, 51.

exposed to high stress situations. For example, while flying a group of cadets on a Beechcraft, an electrical fire broke out under the cockpit, and the crews could not control the blaze.<sup>165</sup> As the plane descended, Shelby tried to make an emergency landing onto a dry riverbed. The problem was the fire continued to engulf the aircraft and at around 5,500 feet, the fire neared the fuel lines and live ordinance. Shelby ordered the crew to bailout, and luckily, the entire crew made it out before the plane crashed.<sup>166</sup> Ultimately, Shelby could pull from wartime experiences and this confidence allowed him to keep up with Hamilton and showcase his talent against Europe's best drivers. His second place finish did not detour the press from covering Shelby, and he graced the European cover of *Motor Racing* in April 1954.<sup>167</sup> Shelby's driving would continue to draw attention as the 1954 start of Le Mans neared.

According to Phil Henny, for a driver to finish first at Le Mans he wins more than a race, as his name will achieve immortality among the automotive community. Racing teams often support an entirely independent team to race at Le Mans.<sup>168</sup> Le Mans is organized a little different than most American racing events in which cars from varying classes are run at the same time. According to Quentin Spurring, the Automobile Club de 'Quest organized the race at Le Mans and awarded points based off of engine volumes, body type, and distance covered.<sup>169</sup> This means that faster and slower cars race alongside each other, and can complicate how drivers navigate the course. According to Shelby, he never quite felt comfortable with this style of

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<sup>165</sup> Shelby, *The Cobra Story*, 26.

<sup>166</sup> Mills, *Carroll Shelby: The Authorized Biography*, 25.

<sup>167</sup> "Technical Details of the Le Mans Jaguars." *Motor Racing*, July 1954.

<sup>168</sup> Phil Henny, *...Just Call Me Carroll...!* (Hudson, WI: Editions Cotty, 2004), VII.

<sup>169</sup> Quentin Spurring, *Le Mans 1923-29: The Official History of the World's Greatest Motor Race* (UK: Evro Publishing Limited, 2016), 34.

organization. The reason is Shelby's DB3S could hit 140mph; the Jaguars were closer to 170; but, the real issue were the Renaults, which fought to reach 80.<sup>170</sup>

Overall, there was little hope of Shelby winning at Le Mans in an Aston Martin. The Jaguars D types and Ferraris 4.9s were heavily favored to win the race. Shelby's only hope was to outlast the competition, and keep a consistent pace even with poor, wet weather conditions.<sup>171</sup> The DBS3 he drove was specifically engineered for tracks with long straights with 224 hp.<sup>172</sup> Shelby adequately applied this power early on and he was able to complete a sub 4 min 50 sec lap. However, he went off the road on his 21<sup>st</sup> lap while trying to navigate around the corner at the end of the Mulsanne straight.<sup>173</sup> While the wreck did not result in any visible damage, the car's driver side wheel, including the brake drum, completely fell off during a later stop.<sup>174</sup> There was little hope of getting the car back together and the only option was to call it quits.<sup>175</sup> According to Laban, all of the cars Aston Martin sponsored failed mechanically and did not complete La Mans; so, Shelby's breakdown was in good company.<sup>176</sup> Thankfully, Wyer understood mechanical mishaps were a part of racing and allowed Shelby to continue racing in European events. In fact, Shelby went on to win his first professional purse of \$2,000 at the

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<sup>170</sup> Mills, *Carroll Shelby: The Authorized Biography*, 52.

<sup>171</sup> Ibid., 53.

<sup>172</sup> Quentin Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1945-59* (New York: Evro Publishing Limited, 2011), 198. In racing, straights are sections of a course where there are no turns and cars can reach high speeds.

<sup>173</sup> Mulsanne straight is a notorious portion of the track at Le Mans where cars had a 3.8 mile straight to gain high speeds. Over half of the deaths at Le Mans have been on this portion of the course. Furthermore, at the end of the straightway it transitions into a sharp turn, which some drivers fail to adequately slowdown. Pat Bondurant, "1964 Le Mans," YouTube video, duration 9:40, posted February 2014, <https://www.youtube.com/watch?v=h8N1hMVGbuw>.

<sup>174</sup> Mills, *Carroll Shelby: The Authorized Biography*, 53.

<sup>175</sup> Shelby, *The Cobra Story*, 56.

<sup>176</sup> Laban, *Shelby and the AC Cobra*, 15.

Supercortemaggior GP held at Monza by finishing in 5<sup>th</sup> place.<sup>177</sup> Shelby left Europe in August 1954, but his success secured his reputation in Europe, and he knew he would return to finally win Le Mans. However, his focus returned to American motorsports, once he again immersed himself into hot rod culture.

The Bonneville Salt Flats in Utah demonstrates the ingenuity of hot rod culture, and how even amateur drivers can break speed records. Early in the 20<sup>th</sup> century, the salt flats were used as a testing ground for speed and durability. According to Jessie Embry, in 1907 Teddy Tezlaff drove his Blitzen Benz faster than those racing at Daytona Beach.<sup>178</sup> However, the automotive industry did not recognize the potential of the flats until Ab Jenkins beat the celebrity train from Salt Lake City to Wendover in 1927. Also, in 1931 Jenkins set another record by driving 24 hours straight at 112.94mph. It was after Jenkins that others began to run their cars at Bonneville and smash speed records. For example, British driver Sir Malcolm Campbell went over 300 mph at Bonneville after he failed to break the record at Daytona Beach.<sup>179</sup>

After World War II, the Salt Flats became a beacon for hot rodders to test their creations, which developed into Speed Week. According to the organization's brochure in 1952, the goal of Speed Week was not racing, but to spur competition between hot rodders. Furthermore, their efforts to attain speed were to be interpreted as a hobby and to take a car designed by engineers and push it to the limits.<sup>180</sup> Hot rodders rarely create original design but rather modify existing

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<sup>177</sup> Ibid., 21.

<sup>178</sup> Jessie Embry, "The Last Amateur Sport: Automobile Racing on the Bonneville Salt Flats," *Americana: The Journal of American Popular Culture, 1900 to Present* 2:2 (Fall 2003): 1.

<sup>179</sup> Ibid., 1.

<sup>180</sup> Bonneville speed week program in Jessie Embry, "The Last Amateur Sport."

vehicles.<sup>181</sup> It was here that Shelby interacted with those hot rodders and participated in their quest for speed.

While Shelby began to settle back in Texas, he received a call from Donald Healey, who established the Donald Healey Motor Company, who offered him a chance to drive a modified Austin Healy. Shelby noted he did not have any other commitments so he jumped at the chance to break a speed record. Healey put together an experienced team of former military pilots that included George Eyston, Morris-Goodall, and Roy Jackson. The vehicle used was a modified Austin Healey 100, but unlike the production car, it was fitted with streamliner panels and a supercharged motor.<sup>182</sup> It was common at this time for hot rodders in America to use European sports cars because World War II forced many American manufactures to halt production. Returning GIs took what Europe had to offer, but improved upon the design.<sup>183</sup>

On August 23, 1954, Shelby participated in a group effort to break the 24-hour driving record, which they set at 132 mph.<sup>184</sup> According to Laban, the group broke seventy class D records with their modified Austin Healey and by the end of the weekend *The Washington Post* reported a total of 91-records over the weekend.<sup>185</sup> Shelby's participation within Boneville in 1954 was not a significant accomplishment and few today would even make note of his involvement. However, it demonstrates his commitment to immersing himself within automotive

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<sup>181</sup> Louise Ann Noeth, *Bonneville Salt Flats* (Osceola, WI: MBI Publishing Company, 1999), 67.

<sup>182</sup> Mills, *Carroll Shelby: The Authorized Biography*, 55-56. "Donald Healey Biography," Automotive Hall of Fame, accessed February 8, 2017, <http://www.automotivehalloffame.org/inductee/donald-healey/686/>.

<sup>183</sup> Colin Comer, *The Complete Book of Shelby Automobiles Cobra, Mustangs, and Super Snakes* (Minneapolis, MN: Motorbooks, 2009), 8; and Christ Conrad, "August 23 and 24, 1954," *Moss Motoring*, last updated May 24, 2012, accessed on April 10, 2017, <http://www.mossmotoring.com/august-23-and-24-1954/>.

<sup>184</sup> Mills, *Carroll Shelby: The Authorized Biography*, 55-56.

<sup>185</sup> Laban, *Shelby and the AC Cobra*, 22; and "British Sports Cars Set 91 Speed Records," *The Washington Post and Times Herald*, August 18, 1956, 9.

culture. His time out in Bonneville also taught him to pace himself while driving, which would help later on in his career.<sup>186</sup> Shelby was not content with just racing on dirt or at an event at Le Mans, but wanted to experience almost every iteration of automotive racing. Once Shelby succeeded at Bonneville he looked for any opportunity to get behind the wheel and Donald Healey offered him the chance to fill his desire for competition by racing in South America.<sup>187</sup>

While driving for Healey in Bonneville, Shelby secured a spot on his racing team and traveled to the Carrera Pan-Americana in November. For this event, Shelby would be piloting the same Austin Healey that he drove at Bonneville, and this was the first time a British auto manufacturer sponsored a team to participate in this event. The race was in honor of Mexico completing the Mexican portion of the Pan-American Highway. Drivers started out near the boarder of Guatemala and finished 1,900 miles and five days later at Juarez. Shelby and Roy Jackson would take turns driving the Austin Healey.<sup>188</sup> Furthermore, this type of racing not only pushes the individual to his limits, but also the car, which needed to be occasionally reconfigured depending on the environment. For example, back axle ratios were altered between the stock 2.9, but changed to a 2.7 for when the course transitioned into longer straightaways. Most teams try to practice before a race starts, but due to scheduling delays, Shelby and his team were unable to sufficiently prepare for the course, which already claimed several lives. Two Argentinean drivers were killed during practice after they accidentally drove their Ford off the road and into a valley.<sup>189</sup> Shelby would experience first-hand the dangers of flying blind.

Shelby and his co-driver Jackson decided it was best for each to ride separately during

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<sup>186</sup> Shelby, *The Cobra Story*, 66.

<sup>187</sup> Evans, *Carroll Shelby: A Collection of My Favorite Racing Photos*, 47.

<sup>188</sup> Laban, *Shelby and the AC Cobra*, 22.

<sup>189</sup> Mills, *Carroll Shelby: The Authorized Biography*, 57.

the race. Generally, drivers would ride together throughout the race, but their lack of practice convinced both drivers they needed to demonstrate some restraint.<sup>190</sup> This proved to be a wise decision as Shelby wrecked 109 miles into the event. He entered too fast into a corner and smashed into a large bolder, which sent his Austin Healey flipping through the air four or five times.<sup>191</sup> Once he came to a stop Shelby realized he had injured his arm, but instead of emergency crews coming to his aid, only spectators were within reach. The Baltimore Sun reported that Shelby broke both arms during the accident.<sup>192</sup> The locals dragged Shelby to a shady tree where he proceeded to drink away his pain. By the time medical professionals reached Shelby six hours later, he was already beyond the need of anymore painkiller. Due to his accident, Shelby never regained full mobility of his arm, and the doctors in Mexico stressed to him he needed to not use it for several months.<sup>193</sup> However, he would not let an injury keep him out of the driver seat.

By January 1955, Shelby was once again driving, but required a cast on his right arm.<sup>194</sup> While his arm was still healing, he replaced his cast with a glass-fiber and even taped his hand to the steering wheel in order to continue racing. This setup did not stop him from competing and while he recovered, he piloted along with Phil Hill a 3-litre Ferrari to second place at the 12-hours at Sebring.<sup>195</sup> At first, the pair thought they had won, but after an official investigation the

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<sup>190</sup> Laban, *Shelby and the AC Cobra*, 23.

<sup>191</sup> Shelby, *The Cobra Story*, 68.

<sup>192</sup> "Hill Leading in Road Race," *The Baltimore Sun*, November 21, 1954, S8.

<sup>193</sup> Mills, *Carroll Shelby: The Authorized Biography*, 59-60; and Evans, *Carroll Shelby: A Collection of My Favorite Racing Photos*, 51; and Daryl E. Murphy, *Carrera Panamericana: History of the Mexican Road Race 1950-1954* (Osceola, WI: Motorbooks International, 1993), 125-130.

<sup>194</sup> "12 Hour Race Ends In Mixup," *The Baltimore Sun*, March 14, 1955, 14.

<sup>195</sup> Laban, *Shelby and the AC Cobra*, 23.

win was given to Jaguar.<sup>196</sup> However, Shelby and Hill moved on to the next race, but this time as competitors. Shelby competed against Hill at Torrey Pines, which was the first National SCCA race to be held at this particular circuit. According to Mills, Hill was considered the best driver in California, and yet Shelby kept pace. Shelby's efforts resonated with a particular spectator, Tony Paravano, who was looking for drivers to sponsor in order to race his collection of Ferraris.<sup>197</sup>

Shelby's relationship with Parravano allowed him to continue racing. For their first race in July, Shelby traveled to Washington State to participate in the Seattle Seafair. Parravano provided his Ferrari 375+, which at that point was the most powerful car Shelby had driven. Unfortunately, Shelby was unable to overcome Phil Hill and his Ferrari Monza, and had to settle for second place. Shelby's partnership with Parravano also brought him into contact with some of the most prestigious automotive builders in the world such as Enzo Ferrari.<sup>198</sup> Parravano and his family took Shelby to Italy, where he planned to buy a new Ferrari or two.<sup>199</sup> According to Laban, Shelby felt Enzo was an arrogant and overbearing individual, but his son Alfredo "Dino" Ferrari was much more receptive, and opened doors which Enzo wished had remained closed.<sup>200</sup> It was here that Shelby not only viewed the manufacturing process of Ferrari and Maserati, but also sat down with "Dino" Ferrari to absorb lessons on racing and the business side of the automotive industry. "Dino" showed some of Ferrari's future projects and shared his ideas for innovating current V-6 and V-8 designs. Unfortunately, their partnership did not last another

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<sup>196</sup> "12 Hour Race Ends In Mixup," *The Baltimore Sun*, March 14, 1955, 14.

<sup>197</sup> Mills, *Carroll Shelby: The Authorized Biography*, 64-65.

<sup>198</sup> *Ibid.*, 69.

<sup>199</sup> Shelby, *The Cobra Story*, 76.

<sup>200</sup> Laban, *Shelby and the AC Cobra*, 23.



year, as Dino would die from complications with muscular dystrophy.<sup>201</sup> Shelby would carry the lessons Dino shared that summer in Italy, and it would help to shape his future vision as an automotive builder.

Shelby and Parravano ended 1955 by coming in second in Class C of the SCCA National Championship, and they looked for a repeat performance for 1956. However, Shelby's drive in the 410s Ferrari in February 1956 would be his last race with Parravano. Parravano was caught paying drivers at Willow Springs, and the SCCA banned him from racing for a whole year. Shelby was wise enough to keep his distance just prior to the ruling so he avoided the punishment. The problem for American drivers is racing was still defined as an amateur sport meant for gentlemen. Drivers including Shelby tried to change the SCCA's rules and protested by wearing bowler hats during races, which signified their involvement within the Run for Money (RFM) club. While Shelby openly protested, he worked around the rules. Shelby and other drivers found ways to get around receiving compensation, such as being paid overtime while "working" for Parravano. Team owners could hire a driver as their own service manager or sales rep, but not as a driver, and Shelby stayed away from being paid directly.<sup>202</sup> Losing Parravano only temporarily set Shelby back but he quickly found sponsors to pick up the tab.

During the 1956 season, Shelby worked with several sponsors including Wyer and his factory team with Aston Martin, and private teams run by Joe Landaker and John Edgar. According to Mills, Shelby won a staggering nineteen times in a row that season including a record setting pace at the Giant's Despair Hill Climb in Pennsylvania.<sup>203</sup> Also, at this time *The*

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<sup>201</sup> Mills, *Carroll Shelby: The Authorized Biography*, 68-69.

<sup>202</sup> Mills, *Carroll Shelby: The Authorized Biography*, 77-78; and Allan Girdler, *American Road Race Specials 1934-1970* (Osceola, WI: Motorbooks International Publishers, 1990), 81.

<sup>203</sup> Mills, *Carroll Shelby: The Authorized Biography*, 85.

*New York Times* published an article describing Shelby as, “One of America’s finest sports car racing drivers...”<sup>204</sup> Unlike at the beginning of his career, Shelby demonstrated that his ability to drive went beyond just being aggressive. While piloting Edgar’s 857s Ferrari at the Montgomery races in California, Shelby showcased his ability to recover from mechanical malfunctions.<sup>205</sup> During the race, his front brakes locked up and it sent his car into the sandbanks, which set him behind by thirty seconds from the rest of the competitors. However, instead of dropping out of the race, Shelby drove his 857s to the limits and got within seven seconds of the leading Jaguars. Regrettably, his front brakes once again locked up sending him into the same sandbank.<sup>206</sup> Even though Shelby lost this race, his winning season more than made up for this single failure. In fact, *Sports Illustrated* named him Sports Car Driver of the Year for 1956.<sup>207</sup> This meant a lot to Shelby, but it did not pay the bills, and so he opened his first car dealership.<sup>208</sup>

Beginning in 1956, Shelby laid out his plans out for a sports car dealership in Texas. Initially, Shelby was open to selling a variety of European cars, but after meeting with Ferrari, it was clear their relationship could only go so far beyond pleasantries. Ferrari and Shelby discussed the possibility of driving for him during the next season, but they disagreed on the pay structure. When Shelby inquired about his salary, Ferrari responded by stating that being allowed

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<sup>204</sup> Frank M. Blunk, “Motor Car Sports Texas Driver Puts His Foot Down When He Gets Urge To Race With Wind,” *The New York Times*, September 26, 1956, 89.

<sup>205</sup> Art Evans, *Shelby, the Race Driver With Remembrances by Carroll Shelby* (Redondo Beach, CA: Photo Data Research, LLC, 2008), 72.

<sup>206</sup> Mills, *Carroll Shelby: The Authorized Biography*, 88; and Evans, *Carroll Shelby: A Collection of My Favorite Racing Photos*, 80.

<sup>207</sup> “Carroll Shelby,” *Sports Car Club of America*, accessed January 14, 2017, <https://www.scca.com/pages/carroll-shelby>.

<sup>208</sup> Shelby, *The Cobra Story*, 89.

to drive was enough reward.<sup>209</sup> Another reason why Shelby declined was Ferrari's habit of interfering with drivers and creating division among his team. According to Wyss, Ferrari would visit his drivers and discuss how their teammates were disrespecting them behind their back. It is suspected that Ferrari wanted to create healthy competition between his team, but in a 1990's interview Shelby directly blamed Ferrari for his friend Musso's death.<sup>210</sup> While Shelby loved speed and identified with the hot rod community, this did not mean he could race without compensation or strictly for prestige. Ferrari offered Shelby the cold shoulder, but he found a more receptive audience with Maserati both with business and racing.<sup>211</sup>

During the 1957 racing season, Shelby also continued to establish his sports car dealership known as the Carroll Shelby Sport Cars of Dallas. In order to help secure his business, he had the financial backing of Dick Hall, a rich Texan who built his fortune from the oil industry. Shelby could not manage the business; so, he turned to the hot rodders of California to find a candidate to work on the cars. A hot rodder, known as Raoul Balcaen, answered his call and moved to Dallas. Furthermore, Shelby did not adhere to a particular brand, but tried to sell just about anything including a German Bubble Car, which had the unique feature of only opening from the front of the car.<sup>212</sup> Also, his relation with Wyer allowed him to become one of the first Maserati dealers in America.<sup>213</sup> This business demonstrates Shelby's ability to organize and create a company without using his own money or even running the day-to-day operations.

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<sup>209</sup> Ibid., 88-89.

<sup>210</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 25. Musso's crashed in 1957 on the 10<sup>th</sup> lap, trying to beat his teammate Mike Hawthorn, during the French Grand Prix at Reims, France after he miscalculated a corner and landed in a ditch. First responders were able to take him to hospital, but he later succumbed to his injuries. Damien Buckland, *Collection Editions: Ferrari in Formula One* (CreateSpace Independent Publishing Platform, 2015).

<sup>211</sup> Mills, *Carroll Shelby: The Authorized Biography*, 95.

<sup>212</sup> Ibid., 100-102.

<sup>213</sup> Shelby, *The Cobra Story*, 89.

This ability to find and place individuals into occupations in which they could excel would benefit him as he transitioned into a builder. Shelby did not know how to design a car, but he knew how to find those that could. However, Shelby's career as a driver was still his primary focus, and his relation with John Edgar allowed him to continue to race for Maserati.

The 1957 racing season saw a dramatic shift in how races were organized. Instead of using old runways and impromptu courses, specifically designed and built courses were popping up around America. Shelby drove Edgar's 300s at the opening event at Laguna Seca, which had replaced the adapted track at Pebble Beach.<sup>214</sup> Over the weekend, Shelby finished first on Saturday and fourth place on Sunday. His win on Saturday would be one of nineteen that season.<sup>215</sup> Shelby's performance was also accompanied by reappearing on the cover of *Sports Illustrated* as the driver of the year.<sup>216</sup> However, Shelby's season came to an abrupt end in September at Southern California after he wrecked on his first practice lap.<sup>217</sup> According to Mills, Shelby entered a corner with too much speed and slammed into a low bank. As a result, Shelby injured his face, neck, and back, which required doctors to fuse three vertebrae together.<sup>218</sup> He did demonstrate his bravado, however, in November by climbing back into and winning at Riverside with the same car he wrecked.<sup>219</sup> According to Shelby, "The Riverside crash didn't cool off my love of racing one bit. I still hadn't, at this time, achieved what I wanted

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<sup>214</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 24; and Girdler, *American Road Race Specials 1934-1970*, 81.

<sup>215</sup> Laban, *Shelby and the AC Cobra*, 26.

<sup>216</sup> Kenneth Rudeen, "The Gentle Leadfoot," *Sports Illustrated*, March 25, 1957.

<sup>217</sup> Laban, *Shelby and the AC Cobra*, 27.

<sup>218</sup> Mills, *Carroll Shelby: The Authorized Biography*, 112.

<sup>219</sup> Laban, *Shelby and the AC Cobra*, 27.

to do in racing, nothing much is going to cool it off till you draw your last breath.”<sup>220</sup>

This accident marks a crucial transition in the safety standards for automotive racing. Track organizers were trying to make racing safer for spectators and drivers, but their efforts did not completely eliminate the danger. Lou Brero died from his injuries while practicing at Dillingham Field. After crashing, Brero’s Jaguar burst into flames and he was unable to recover from his injuries.<sup>221</sup> While not an outcome of Shelby’s accident, Shelby’s days racing for Maserati were numbered and after the Grand Prix in Cuba he would primarily race for Aston Martin during the 1958 race season in Europe.<sup>222</sup>

For the 1958 season, Shelby traveled to several interesting places including Cuba to participate in the Grand Prix in February. This season went much like the previous, if not a little below average. Edgar sponsored Shelby and provided a 450s Maserati and Ferrari 4.9 for him to drive.<sup>223</sup> After Shelby returned to the states, he set out to prepare to race in Europe. According to Mills, Shelby’s wins in 1954 and 1955 added credibility to his name. However, Europe not only offered Shelby the chance to race, but also to learn about automotive design and manufacturing.<sup>224</sup> The design and development of the Cobra would mirror much of what he learned during his trips to Europe. Shelby stated to the *Las Vegas Sun*, “I enjoyed driving race cars, but that wasn’t where I was trying to go. I wanted to build my own car.”<sup>225</sup> While Shelby began looking towards his career after racing 1959, he still needed to reach the pinnacle of

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<sup>220</sup> Shelby, *The Cobra Story*, 94.

<sup>221</sup> Mills, *Carroll Shelby: The Authorized Biography*, 107.

<sup>222</sup> *Ibid.*, 128.

<sup>223</sup> Shelby, *The Cobra Story*, 108.

<sup>224</sup> Mills, *Carroll Shelby: The Authorized Biography*, 128.

<sup>225</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 33.

motorsports by winning at Le Mans.<sup>226</sup>

Aston Martin placed Shelby with Roy Salvadori, and each needed to complete 34 laps at an average of 4 min and 20 sec per lap. Salvadori had a lot of experiencing racing at Le Mans with seven appearances before his drive with Shelby.<sup>227</sup> Wyer studied the lap times of past Le Mans winners and found that even though the track record was set at 3 min and 58 sec the winning average was 4 min 24.5 secs.<sup>228</sup> Long distance racing requires teams to develop a completely different set of tactics, and strike a balance between reliability and speed.<sup>229</sup> This meant in order for Carroll and Salvadori to achieve victory they did not have to set the fastest lap, but maintain the fastest average. Salvadori was the first to drive, and even with a quick pace, Salvadori was several places behind first place by the time Shelby took over. Shelby was able to maintain a consistent lap time, which allowed him to move up the ranks as other cars began to falter. For example, he moved into 5<sup>th</sup> place after the gearbox in Masten Gregory's Ferrari started failing. As the race went on more cars started to breakdown to the point where Shelby and Salvadori pulled into first place. The fierce D-type Jaguar's motor completely died, and the leading Ferrari experienced a headlight fault, and once it pulled into the pits, Salvadori took its place in the number 5 Aston Martin.

As Salvadori reentered the race, the vibration within his Aston Martin became more noticeable and he had to fight the car on every corner and could hardly complete a single lap. It

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<sup>226</sup> Shelby, *The Cobra Story*, 122.

<sup>227</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1945-59*, 344.

<sup>228</sup> Mills, *Carroll Shelby: The Authorized Biography*, 170.

<sup>229</sup> William S. Stone, *A Guide to American Sports Car Racing* (Garden City, NY: Doubleday & Company, Inc., 1971), 59.

took Salvadori roughly 30 min for him to finish four laps.<sup>230</sup> Once he entered the pits the mechanics feared the worst, but were pleasantly surprised to find out the tires just needed to be replaced after being shredded by a piece of steel. Unfortunately, this single stop cost the team ten minutes of time and allowed the Ferrari time to pass them for first place.<sup>231</sup> While Shelby was able to quickly rejoin the race he was now close to four laps or 33 miles behind the leading Ferrari with little hope of catching him.<sup>232</sup>

Shelby continued to set a consistent pace and hoped the Ferrari would have a problem. Unexpectedly, the Ferrari driven by Phil Hill and Olivier Gendibien made a stop, which allowed Shelby to make up about two laps, but he still was a long way off by the time Salvadori took over.<sup>233</sup> As Salvadori continued to push the Aston Martin, it came over the radio that the Ferrari had not only made another stop, but also stopped again after only completing a single lap. One of Shelby's teammates walked over to the Ferrari pit and found the team working on the engine.<sup>234</sup> However, the noise the Ferrari made around the track did not sound healthy and after only a couple laps it pulled into the pits. This time it did not return.<sup>235</sup> The Ferrari was overheating and the pit crews could not figure out how to fix it, and eventually the motor seized.<sup>236</sup> Aston Martin and Shelby's luck had turned around. Shelby anticipated the win and changed out of his official racing suit in order to win in his stripped overalls. After driving for 2,720 miles, Shelby and

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<sup>230</sup> Mills, *Carroll Shelby: The Authorized Biography*, 174.

<sup>231</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1945-59*, 344.

<sup>232</sup> Mills, *Carroll Shelby: The Authorized Biography*, 174.

<sup>233</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1945-59*, 346; and Mills, *Carroll Shelby: The Authorized Biography*, 174.

<sup>234</sup> Ibid.

<sup>235</sup> Shelby, *The Cobra Story*, 153-154.

<sup>236</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1945-59*, 346.

Salvadori crossed the finish line and officially won the 1959 race at Le Mans.<sup>237</sup>

*The Baltimore Sun* reported winning Le Mans was the pinnacle of Shelby's racing career, and it was becoming clearer to him that he would need to find another career beyond driving.<sup>238</sup> During the race, Shelby was unknowingly suffering from dysentery.<sup>239</sup> However, this was only a small portion of his health issues as Shelby's doctors diagnosed him with angina pectoris, and only gave him a couple years to live. Throughout his life and career as a driver, he suffered from chest pains and in order to suppress them he constantly traveled with nitroglycerine pills.<sup>240</sup> According to Laban, he even hid his condition from his teammates at Le Mans and raced with them under his tongue, so he could keep going.<sup>241</sup> Shelby retired from racing at the age of 37, and even though his career only lasted 8 years, he had little else to prove. Over his career, he piloted over 45, participated in 150 races, and won over a third of those he entered. This experience would prepare him for his Cobra project and future relationship with Ford.<sup>242</sup> Shelby stated in an interview, "I had a lot of fun driving race cars, but it wasn't my NO.1 priority. Driving race cars was an avenue for me to learn how to build my own car, and that was my ambition all along."<sup>243</sup>

At the time, Shelby was only the third American driver to win at Le Mans and he could

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<sup>237</sup> Mills, *Carroll Shelby: The Authorized Biography*, 174; and "Shelby, Partner Win at Le Mans: 3000,000 Person Watch Set Blistering Pace," *The Washington Post and Times Herald*, June 22, 1959. A5.

<sup>238</sup> "Texan Wins at Le Mans: Salvadori Joins Shelby in Auto Victory," *The Baltimore Sun*, June 22, 1959, S15.

<sup>239</sup> Mills, *Carroll Shelby: The Authorized Biography*, 175.

<sup>240</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 34.

<sup>241</sup> Laban, *Shelby and the AC Cobra*, 29.

<sup>242</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 34.

<sup>243</sup> Shav Glick and Jerry Hirsch, "Carroll Shelby Dies at 89; Cult Classic Car Designer," *Los Angeles Times*, May 12, 2012.



have rested on his accomplishments, but that was not his nature. Shelby hung up his racing overalls after coming second at the Pacific Grand Prix in 1960, but he moved to California in order to surround himself with hot rodders and custom builders so he could begin building his sports car.<sup>244</sup> He later stated, “The reason I moved to California the first time was to build the Cobra. I thought it was stupid to have a 1918 taxicab engine in what Europeans like to call a performance car when a little American V8 could do a better job.”<sup>245</sup> Here Shelby, would apply everything he learned from racing and employ the lessons he learned from hot rodders and the automotive industry to create the Cobra.

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<sup>244</sup> Motor Trend, *Shelby: A Tribute to An American Original*, 20; and Laban, *Shelby and the AC Cobra*, 29.

<sup>245</sup> R&T Staff, “Words of Wisdom From Carroll Shelby,” R&T, last modified May 14, 2014, accessed on January 22, 2017, <http://www.roadandtrack.com/car-culture/interviews/a18116/words-of-wisdom-from-carroll-shelby/>.

### Chapter 3: The Cobra is Born

After Shelby retired from racing at the age of 37, he transitioned into a simpler existence and found a new joy in music and home life. According to Shelby, he found pleasure in coming home and unwinding with scotch on the rocks and listening to Frank Sinatra or Patsy Cline. His heart condition seemed to be improving with the stress of racing gone and being able to finally relax.<sup>246</sup> Shelby stated in an interview with Jim Grahma, “After you get skinned and cut up enough, you begin to look around for another business.”<sup>247</sup> While Shelby enjoyed being retired, his dreams of one day building an American sports car remained alive. The issue for Shelby and his dreams was that he was broke. Also, Shelby had sold off his remaining stock in the Carroll Shelby Sports Car dealership back in 1958, so he had no business venture to fall back on once he retired from racing.<sup>248</sup> According to *Motor Trend*, Shelby was struggling to earn a living.<sup>249</sup> Even though Shelby conquered Le Mans and the USAC Championship, his finances unfortunately did not reflect his success. During this time, Shelby and his wife primarily ate hash, and for a bit of luxury, they ate cheese and crackers. Furthermore, the market for an American built sports car did not seem realistic, as there were a plethora of established European racing cars to buy and modify.<sup>250</sup>

Chevrolet at this time cornered the America market with their Corvette, which for years had competed against Europe’s best.<sup>251</sup> The Corvette was the primary domestic-industry built

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<sup>246</sup> Mills, *Carroll Shelby*, 209.

<sup>247</sup> Carroll Shelby, *The Cobra Story* (Minneapolis, MN: Motorbooks, 1965), 178.

<sup>248</sup> *Ibid.*, 179.

<sup>249</sup> *Motor Trend*, *Shelby: A Tribute to An American Original* (Minneapolis, MN: Motorbooks, 2012), 23.

<sup>250</sup> Mills, *Carroll Shelby: The Authorized Biography*, 209.

<sup>251</sup> *Ibid.*

sports car, but hot rodders had hodgepodged their own versions of an American racecar for years. The Scarab was an American sports car funded by Lance Reventlow, the heir to the Woolworth empire. While Reventlow had the resources to build a proper sports car, it still rested on the laurels of hot rod culture. Equipped with a large Chevy V8 and a lightweight chassis the car made close to 400-horse power. A portion of the Scarab's racing success is in part due to hot rodders such as Phil Remington and Clay Smith who pushed the engine and chassis to its limits. Remington would later work for Shelby and help him build his American sports car.<sup>252</sup> While Shelby wanted to build a car, he did not have the resources, like Reventlow, to self-fund such a project. Even with his credibility, Shelby could not garner any investors and in order to achieve his dream he would need to find another way to fund it.

Professionally driving cars, while exciting, does not provide an individual with a variety of skills beyond racing. So beginning in 1961, Shelby decided to instill some of the driving skills he learned over the years in those who wished to race. The owners of the raceway at Riverside allowed Shelby access to the course for a small fee, and during off-hours, he created the Shelby School of High Performance<sup>253</sup> driving. He tried to reach his target audience by advertising in *Motoracing* magazine but it was to little avail, as few individuals would pay to learn from Shelby.<sup>254</sup> Besides teaching others how to drive was not his end goal and did not satisfy his desire to build a true American sports car.<sup>255</sup> This was a difficult time for Shelby and his wife, and she states, "Yes-we'd gotten married and I now have this man sitting around the house, and I

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<sup>252</sup> Allan Girdler, *American Road Race Specials 1934-1970* (Osceola, WI: Motorbooks International Publishers, 1990), 94.

<sup>253</sup> Shelby, *The Cobra Story*, 186.

<sup>254</sup> Mills, *Carroll Shelby: The Authorized Biography*, 209-210.

<sup>255</sup> Colin Comer, *Shelby Cobra: The Snake That Conquered the World* (Minneapolis, MN: Motorbooks, 2015), 20.

said God, you've got to do something. I can't keep all of this stuff covered."<sup>256</sup> Ultimately, Shelby's past relationships within the automotive industry would help him to reestablish himself and rebrand himself as an automotive designer.

Shelby's job prospects began to turn in April 1961 when Tony Webner, the director of Goodyear's racing division, offered him the opportunity to be a tire distributor. While not a glamorous position, it would place Shelby in charge of distributing performance tires throughout eleven states, including California. Goodyear had dominated the NASCAR circuit and was looking to move into other automotive sports, which included road racing.<sup>257</sup> Webner hoped that Shelby's name could add credibility to their new venture. Shelby moved into a small office in Santé Fe Springs, and set out to build the Goodyear brand within the automotive industry.<sup>258</sup> Furthermore, Shelby continued to advertise for his racing school, but this time in *Sports Car Graphic*, which brought a response of over 1,400 people. This influx of interest motivated Shelby to hire help including, Paul O'Shea, a retired driver, and Joe Landlaker. Along with his driving school, Shelby signed a deal with Champion spark plugs to represent its brand. For the most part, Shelby focused on making these operations succeed, but the desire to build an American sports car never left his mind. According to Shelby, "This thought of turning my dream car into a reality was bugging me more and more, until I could not think of anything else."<sup>259</sup> Shelby looked to create an American car, but ironically, it was a British car company that was receptive to his ideas.

Building a reliable and powerful sports car is a difficult and expensive process, and

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<sup>256</sup> Mills, *Carroll Shelby: The Authorized Biography*, 210.

<sup>257</sup> *Ibid.*, 193; 210.

<sup>258</sup> *Ibid.*

<sup>259</sup> Shelby, *The Cobra Story*, 178.

Shelby tried to keep development costs down by using well-established chassis models such as the Chevy Corvette. The Corvette was a common sight at local racetracks, and Shelby hoped to transform the Corvette into his own interpretation. Ed Cole, the chief engineer at Chevy, actually supplied Shelby with three chassis to fiddle with. Shelby wanted to make his car stand out, so he shipped the cars off to Italy to receive cosmetic changes, but once they returned, they lacked any real appeal. Also, around the same time GM learned of Shelby's plan, and the company quickly shutdown the project in order to protect the reputation of the Corvette.<sup>260</sup> After trying American companies, Shelby then tried to work with John Wyer and Donald Healey, but those deals never moved beyond chatter.

Shelby then wanted to model his car off of a proven formula within hot rod culture by putting a larger American motor into an Austin Healey. However, according to Wallace Wyss, Healey flat-out rejected Shelby's plan of transplanting a Chevy V8 into an Austin Healey.<sup>261</sup> However, the English automotive manufacturer Bristol Aeroplane Company (AC) caught Shelby's attention as the company began to downsize.<sup>262</sup> He learned of their financial troubles while in a meeting with *Sports Car Graphic* over his driving school's ads and the editor John Christy mentioned a press release by AC announcing they would stop making the Ace.<sup>263</sup> AC had experienced financial troubles for a number of years as their models were overpriced compared to their competitors. According to Mills, the Bristol 406 cost several hundred pounds more than an Aston Martin DB4, which priced it beyond the means of a majority of Americans. Even the AC Ace, which Shelby would transform into the Cobra, could not attract enough

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<sup>260</sup> Wallace A. Wyss, *Shelby: The Man. The Cars. The Legend*, 36-37.

<sup>261</sup> *Ibid.*, 36.

<sup>262</sup> Shelby, *The Cobra Story*, 189.

<sup>263</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 37.

customers in America.<sup>264</sup> Even during AC's most profitable year, the company only sold around a hundred cars in America with the high price generally pushing customers away. For example, the Ace started out much higher at £1,440 compared to its competitors such as the Triumph TR3 at £700 and Morgan Plus 4 at £650.<sup>265</sup> Therefore, once Shelby read in the motoring press that AC would discontinue supplying engines for the Ace, it occurred to him that this chassis might serve as the basis for his car.<sup>266</sup>

Shelby was not the first person to envision an American motor in an Ace. In fact, according to Mills, Shelby read an article in *Auto Sport* magazine, where John Bolster put a Ford six cylinder into an Ace. During tests, this car produced some promising results and was eight seconds faster to 100mph than a Bristol.<sup>267</sup> However, this version never really garnered much attention and the company's financial situation kept it from pursuing this design further. Shelby contacted Thames Ditton in London, who had access to the owners of AC, the Hurlock brothers Derek and Charles, with the idea of putting an American V8 into one of their cars. At this time, Shelby had zero loyalty to Ford and initially looked to implant any American motor including Chevy or Buick. Shelby saw the value in using an American engine because it offered buyers a reliable yet powerful platform at a relatively low cost.<sup>268</sup> Furthermore, Shelby's letter to AC did not specifically mention a particular power plant, but did discuss some modifications to the Ace's chassis in order to accommodate an American V8. His letter seemed to resonate with Derek who was eager to experiment with new designs. Internally the company had contemplated

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<sup>264</sup> Mills, *Carroll Shelby: The Authorized Biography*, 218.

<sup>265</sup> *Ibid.*, 216.

<sup>266</sup> Shelby, *The Cobra Story*, 189.

<sup>267</sup> Mills, *Carroll Shelby: The Authorized Biography*, 218.

<sup>268</sup> Shelby, *The Cobra Story*, 190.

putting a Jaguar or Daimler engine into their cars, but the project never saw the light of day.<sup>269</sup> AC responded constructively to Shelby and looked for him to supply a test engine. At this point Shelby did not realize that selling tires and spark plugs would help lead him towards building his dream car with a Ford engine.

While advertising for Goodyear at the Independence Day Hill Climb at Pikes Peak, Shelby spoke candidly with Dave Evans the head of the stock car engine program at Ford. According to Mills, neither Shelby nor Evans recalled the topic of their discussion, but the two parted on pleasant terms.<sup>270</sup> This meeting demonstrates Shelby's initial shift towards Ford and building a relationship with the Detroit automotive industry. Shelby moved onto to his daily routine until he heard of an advanced new engine under development at Ford. Engineers at Ford had developed a new means of engine production that resulted in a lightweight block, which they intended to put into its new Fairlane.<sup>271</sup> The primary difference with this new engine was the thickness of the cylinder walls being thinner than older designs, which shaved several pounds off of the block and brought the weight closer to a six cylinder.<sup>272</sup> The idea of a light but powerful engine encouraged Shelby to write his new friend Evans in hopes he would supply a heart for the Ace.

Within a couple of days Evans called Shelby at his Santé Fe office to let him know Ford would be sending him a couple engines for experiments.<sup>273</sup> Based on Shelby's letter, Evans knew that he intended to implant their new motor into an Ace, and in return only required Shelby to

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<sup>269</sup> Mills, *Carroll Shelby: The Authorized Biography*, 219.

<sup>270</sup> *Ibid.*, 212.

<sup>271</sup> Shelby, *The Cobra Story*, 191.

<sup>272</sup> Mills, *Carroll Shelby: The Authorized Biography*, 219; and Wyss, *Shelby: The Man. The Cars. The Legend*. 38.

<sup>273</sup> Mills, *Carroll Shelby: The Authorized Biography*, 220.

inform them of the outcome.<sup>274</sup> According to Wyss, Ford looked to the hot rod culture in California as a testing ground to see how much power they could squeeze out of their new engine. Back in 1955, hot rodders were able to double the power output of Chevy's V8, so Ford hoped the same would happen to their new 220 cubic inch V8. Ford's Vice President in 1960, Lee Iacocca, saw how the market was shifting towards sporty design and so the company invested in motors that were more powerful as well as in sportier cars.<sup>275</sup> Shelby represented an opportunity for Ford because with a little investment could reap a huge reward.<sup>276</sup> Since 1957, Ford had honored the Automobile Manufacturers Association's safety resolution and stopped funding racing teams. However, beginning in 1960 the company looked for ways to reenter racing.<sup>277</sup> Shelby's plan also fit within their idea of a companywide policy of total performance. Ford wanted to participate in various iterations of racing from rally to Formula One, which they hoped would translate into greater sales.<sup>278</sup> Ultimately, Shelby acted as a bridge between hot rod culture and Detroit industry because he had experience in both realms. During his time as a driver, he raced with hot rodders in Bonneville and while in Europe he toured the factories of Aston Martin and Ferrari.<sup>279</sup> Furthermore, if Shelby's project failed it would not diminish Ford's credibility in the market because it was not responsible for its success. Even the financially stricken Bristol AC Company could not pass up on this opportunity; here was a driver who won Le Mans in a British car. The Ace was on its way out and at this time was an outdated design so

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<sup>274</sup> Shelby, *The Cobra Story*, 191.

<sup>275</sup> Gary L. Witzenburg, *Mustang! The Complete History of America's Pioneer Ponycar* (Princeton, NJ: Princeton Publishing Inc., 1979), 10-11.

<sup>276</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 38.

<sup>277</sup> Leo Levine, *Ford: The Dust and The Glory A Racing History* (New York: Macmillan Company, 1968), 276.

<sup>278</sup> Brian Laban, *Shelby and the AC Cobra* (UK: Crowood, 2015), 61.

<sup>279</sup> Mills, *Carroll Shelby: The Authorized Biography*, 69.



for Shelby to bring Ford to the table only furthered AC's interest in the project.<sup>280</sup>

Shelby organized a shipment of motors to the AC factory in England, and before he actually traveled to England, engineers at AC began to modify the Ace. Towards the end of 1961, Shelby flew to AC and began to directly work with their engineers in order to modify the Ace chassis so it could handle the added power, which they dubbed the Ace 3.6.<sup>281</sup> The current gearbox could only handle around ninety foot-pounds of torque; and so, Ford supplied a transmission rated for four hundred pound feet of torque. Further alterations included adding a rear-end carrier assembly. Once the group sorted those issues out and had a drivable car, Shelby found the Ace's original brakes, steering, or wheel spindles could not handle the added power. Due to these delays, Shelby and Ace were not able to produce a complete car until February 1962.<sup>282</sup> After Derek Hurlock gave a positive response from initial tests at Silverstone Raceway, AC decided to put the car into production.<sup>283</sup>

AC then disassembled the test Ace and sent it to Shelby's company known as Shelby American in Santé Fe Springs, California.<sup>284</sup> Shelby had been able to keep the car under wraps, but when Moon's staff went to pick up the car and John Christy tagged along and took pictures for the next issue of *Motoracing*. In his article Christy stated, "Reventlow's Scarab... Hall's Chaparral... And now it's Shelby's AC Cobra, powered by the new Ford V8 cast iron engine."<sup>285</sup> This statement demonstrates the inspiration behind the Cobra, in that it followed in the footsteps

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<sup>280</sup> Wyss, *Shelby: The Man. The Cars. The Legend*. 38.

<sup>281</sup> Mills, *Carroll Shelby: The Authorized Biography*, 220.

<sup>282</sup> Shelby, *The Cobra Story*, 192-193.

<sup>283</sup> Ibid.

<sup>284</sup> Shelby, *The Cobra Story*, 193; and Motor Trend, *Shelby: A Tribute to an American Original*, 25.

<sup>285</sup> Mills, *Carroll Shelby: The Authorized Biography*, 223.

of former American made sports cars that were influenced by hot rodders. The car, which Ace sent to California, went to Shelby's friend, Dean Moon, who owned an automotive shop. Shelby's relationship with Dean demonstrates his connection with hot rod culture, as Moon was a Californian hot rodder who would further refine the Ace. Furthermore, the car bore the name CSX2002, but even prior to opening the crate, Shelby knew it was to be renamed Cobra. Shelby was not the first person to name a vehicle a Cobra, as several military aircraft from the Bell P-39 Airacobra to the P-63 Kingcobra had dawned the name.<sup>286</sup> According to Mills, there is no record of how Shelby decided on how the name came about, but in Shelby later wrote, "While the machine was on its way from England a strange thing happened. One night I had a dream in which I saw the name Cobra on the front of the new car."<sup>287</sup>

Even though Shelby used Ford and AC parts, he wanted to create a unique product. Wyss notes that in 2000, Shelby still regretted allowing the name AC to be seen on his Cobra, as car enthusiasts still refer to the car as an AC Cobra.<sup>288</sup> Not only did the Cobra receive its trademark name, but also by spring 1962, the hot rodders in California and Detroit engineers would get their chance to improve the Cobra.

While Shelby was in England, Ford wanted to give his project the best odds for fulfilling their idea of total performance and therefore sent him a bigger 260-cubic-inch engine to increase the horsepower.<sup>289</sup> According to Wyss, these engines were still in the experimental stage and

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<sup>286</sup> Ibid., 224, 225; and Wyss, *Shelby: The Man. The Cars. The Legend*, 39.

<sup>287</sup> Shelby, *The Cobra Story*, 193; and Mills, *Carroll Shelby: The Authorized Biography*, 224.

<sup>288</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 40.

<sup>289</sup> Ibid., 39.

when they arrived still adorned the letters XP (Experimental) on the valve covers.<sup>290</sup> Ford also provided an experienced accountant, Ray Geddes, to help Shelby avoid some of the pitfalls of running a business. Shelby states, “It’s thanks to Ray that I was able to plan and guide the financial end of the business where it is today.”<sup>291</sup> These contributions from the Detroit industry helped Shelby run the business side and allowed him to focus on building a car.<sup>292</sup> Along with Ford’s contribution, Shelby had several-experienced builders to help him finalize his Cobra project including hot rod creator Dean Moon and Bonneville racer Fred Larsen.<sup>293</sup> According to Colin Comer, Shelby’s crew of hot rodders installed and refit the larger motor in less than eight hours after receiving the car and engine.<sup>294</sup> Moon modified the first Cobra by replacing the engine mounts in order to fit the larger motor and radiator. After Dean and his crew finished reassembling the car, Shelby wasted little time and quickly jumped in the driver seat and stated, “Get that engine lift out of the way. Let’s see if this sumbitch goes.”<sup>295</sup> The car ran, and at this point was ready for Ford to examine and determine what Shelby had done with its engine.

This was an important point for Shelby as he did not have the means to buy the engines in bulk so the only way to continue would be to put on a good show in hopes that Ford would provide the engines on credit.<sup>296</sup> Following Evans’ suggestion, Shelby brought the car to Dearborn, Michigan and allowed Don Frey, who was in charge of the planning for Ford’s

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<sup>290</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 35-40; and Mills, *Carroll Shelby: The Authorized Biography*, 225.

<sup>291</sup> Shelby, *The Cobra Story*, 196.

<sup>292</sup> *Ibid.*, 196.

<sup>293</sup> Mills, *Carroll Shelby: The Authorized Biography*, 225.

<sup>294</sup> Comer, *Shelby Cobra: The Snake That Conquered the World*, 23.

<sup>295</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 39.

<sup>296</sup> Shelby, *The Cobra Story*, 194.

engineering department to inspect the vehicle. On the outside, Frey was an “academic”, but unlike his colleagues, he understood Shelby’s vision for a sports car. According to Shelby, the problem with Ford and the automobile industry is they did not love cars, but rather saw them as a tool to make money. Frey was cut from a different cloth and after personally viewing the Cobra; he said to Shelby, “You know, I think you may have something there.”<sup>297</sup> Shelby, with his Cobra, succeeded in bridging the gap between hot rodders and Detroit automotive industry but now he needed to prove the car could sell and win races.

Once Shelby received the green light for production from Ford and AC, he needed to find a suitable shop to build his Cobra. Shelby knew he needed to build his Cobra in California, and unlike the Detroit industry, this place loved cars:

I knew that California was about the only place where you might find the type of people who not only could work with their hands but also understood high-performance machinery. There are probably more people in this area dedicated to the ideal of speed on road and track than anywhere else in the world and there is good reason for it. They grew up here, and went to college and got their engineering degrees, and their hobby is cars and their first love is cars, but there is no place else in the country where such enthusiasts could exploit their hobby. Those who did move had to turn to the aircraft industry and gain experience there, but thank heavens my thinking was right.<sup>298</sup>

At the same time Shelby was looking for a shop, Reventlow was in the process of liquidating his Scarab project and shop. According to Dave Friedman, Reventlow and his team went about building their Scarab the wrong way in that the company focused on building a racecar first then a production car. The problem is the SCCA did not pay teams and the IRS only allowed owners to write off their taxes if they proved they had a sellable product. Since the Scarab project was not allocated for the public, Reventlow had to close after recording a financial loss for over five years. New government regulations required that any business that reported a loss for over five

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<sup>297</sup> Ibid., 195.

<sup>298</sup> Ibid., 178.

years be classified as a hobby.<sup>299</sup> Reventlow's shop not only offered Shelby the necessary tools and space to build his Cobra, but also Reventlow's shop manager Phil Remington.

Remington was no ordinary shop manager as he represented the best of hot rod culture. His career as an automotive builder started out much like Shelby's story, as both were veterans of World War II. Remington was born in 1921 in Santa Monica, California, and during his teen years immersed himself in the automotive culture. For example, by the age of seventeen he taught himself welding and fabrication techniques.<sup>300</sup> The start of World War II interfered with his plans of attending college and Remington joined the Army Air Force. The Army Air Force trained him as a B-24 flight engineer and deployed him to the South Pacific.<sup>301</sup> After the war, he returned to Southern California and focused his attention on hot rods and started the Low Flyers Club. Remington could have used his G.I. Bill to attend college, but chose to work as a mechanic. It was during this time he expanded his knowledge of automotive engineering by building and racing a V8 powered hot rod.

Unfortunately, Remington would injure himself in a motorcycle accident, which forced him to primarily focus on building rather than driving.<sup>302</sup> Remington's ability to build and create hot rods allowed him to work on a variety of innovative projects including Stu Hilborn's fuel injection system and Hal Keck's Indianapolis cars. Remington was passionate about building fast

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<sup>299</sup> Mills, *Carroll Shelby: The Authorized Biography*, 233; and Dave Friedman and John Christy, *Carroll Shelby's Racing Cobra* (Minneapolis, MN: Motorbooks, 1990), 20.

<sup>300</sup> Daniel Stohl, "Phil Remington: The Master Fabricator Who Helped Ford Win Le Mans," *Hemmings: The World's Largest Collector Car Marketplace*, June 2011, accessed February 12, 2017, <https://www.hemmings.com/magazine/mus/2011/06/Phil-Remington/3700451.html>.

<sup>301</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 21; and Daniel Stohl, "Phil Remington: The Master Fabricator Who Helped Ford Win Le Mans," *Hemmings: The World's Largest Collector Car Marketplace*, June 2011, accessed February 12, 2017, <https://www.hemmings.com/magazine/mus/2011/06/Phil-Remington/3700451.html>.

<sup>302</sup> Ibid.

cars, so when Reventlow closed down he looked for the next project. Initially Remington looked at the Cobra with some skepticism and felt working with an old design would be a step back, but once Shelby assured him they would go racing, he decided to join.<sup>303</sup>

Shelby now had a shop and crew to build and produce cars, but even with their tests and reconfigurations, each car needed work once they arrived from AC. Fortunately, the shop could easily handle any necessary modifications to get the Cobras fit for racing. As the first Cobras arrived from England, Shelby and his crew made minor modifications from bigger tires to shocks. Along with Remington, Shelby was able to secure mechanics such as Bill Likes from Edelbrock. Likes had the skills and knowledge to fine-tune the motor's ignition and carburetor in order to squeeze more power out of the engine.<sup>304</sup> According to Shelby, the Cobra came together because of these hot rodders, and he states, "...Phil Remington, one of the original hot rodders, along with Stu Hilborn, Frank Koons, Jim Travers, Wally Parks, Vic Edelbrock, and many others who started the hot rod movement back in the thirties."<sup>305</sup> Shelby and his crew could have spent more time modifying the Cobra, but he wanted the car to make its debut at Riverside Raceway in October 1962.<sup>306</sup>

The first official race for Shelby was crucial because not only did it present the Cobra to the world, but also it faced America's sports car the Corvette.<sup>307</sup> At this race, Chevy was also showcasing its new Stingray, which was equipped with a 327-cubic inch motor. Both Shelby and

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<sup>303</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 20; and Comer, *Shelby Cobra: The Snake That Conquered the World*, 26.

<sup>304</sup> Mills, *Carroll Shelby: The Authorized Biography*, 235.

<sup>305</sup> Shelby, *The Cobra Story*, 200.

<sup>306</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 23.

<sup>307</sup> Jerry W. Passon, *The Corvette in Literature and Culture: Symbolic Dimensions of America's Sports Car* (Jefferson, NC: McFarland & Company, Inc., Publishers, 2011), 4.

General Motors ran into a small issue being that to race at a SCCA production event, manufacturers needed to have a hundred completed vehicles intended for retail. Neither the Cobra nor Stingray met this requirement, but they were able to work out a deal in which both cars were entered as experimental production.<sup>308</sup> This meant the cars could race, but could not receive any points towards the overall championship.<sup>309</sup> At this point, Shelby did not seem to care about points, but rather proving to everyone he could compete with the best. For the race, Shelby placed Billy Krause at the helm because of his experience as a dirt track driver. At the start of the race, the Stingray quickly took first place by over half a lap, but eventually returned to the pits due to an engine malfunction. This allowed the Cobra to take first place and lead the race for the next thirty minutes. Unfortunately, the Cobra's first race ended soon thereafter as the rear hub completely broke in half. The problem was the part was initially designed for a Jaguar, and could not withstand the increased stress created from the Ford engine.<sup>310</sup> While the car failed to finish its first race, it did not detour Shelby or his crew of hot rodders.

The Cobra failing to finish did not speak negatively of Shelby or his car. Breakdowns are an unfortunate part of racing, and Shelby's racing career is filled with examples of equipment malfunctioning. Ultimately, the Cobra's initial failure was just a bump in the road, and was an opportunity for his hot rodders to showcase their ability to innovate and make stronger parts. According to Friedman, once the Cobra returned to the shop, Remington broke down the rear hub and constructed a new set out of forged steel billets. The part proved so superior over the original design, which was a mass produced part from Jaguar that a Cobra never again broke

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<sup>308</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 23.

<sup>309</sup> Ibid.,; and Mills, *Carroll Shelby: The Authorized Biography*, 237.

<sup>310</sup> Mills, *Carroll Shelby: The Authorized Biography*, 237; and Friedman and Christy, *Carroll Shelby's Racing Cobra*, 21-23; and Motor Trend, *Shelby: A Tribute to An American Original*, 32.

down during a race due to a split rear hub.<sup>311</sup> Shelby understood that building a new car takes time and is an evolutionary process, and once he was able to get the car back together, he shipped two Cobras to compete at Nassau Speed Week in the Caribbean.<sup>312</sup> Shelby sponsored one of the Cobras. Holman and Moody, who are considered the first private sponsors, supported the second.<sup>313</sup>

The course was a converted tarmac and was notorious for being rough on cars. The sand from nearby beaches would often cover the course in fine grit that would drastically reduce the lifespan and grip of racing tires. As a result, race organizers scheduled this event towards the end of the season and auto manufactures used this as an opportunity to test the reliability of their cars.<sup>314</sup> Billy Krause was selected by Shelby to represent his shop, and during the first race, the Cobra quickly took first place. However, both Cobras failed to complete the race, with Shelby's one dropping out after experiencing an issue with the steering.<sup>315</sup> This failure again demonstrated the ingenuity of Shelby's mechanics and their ability to quickly resolve issues. Don Pike repaired the damaged Cobra by welding and fabricating new parts, and was able to get the car ready for the Three-hour Trophy Race.

For this race, the Cobra was entered into the GT class and competed against a multitude of performance cars from Ferrari 4.9s, Ferrari Testa Rossas's, Porches RS's, and Maserati

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<sup>311</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 21-23.

<sup>312</sup> Wyss, *Shelby: The Man. The Cars. The Legend*. 52.

<sup>313</sup> A privately funded car means that a team uses a manufactured car, but instead of being funded by a corporation such as Ford or Ferrari it is generally made up of a small group of individuals. Joe Miller, "GM Uses Web To Spread Cadillac Message at Le Mans", *Automotive News Europe*, last updated June 19, 2000, accessed April 8, 2017, <http://europe.autonews.com/article/20000619/ANE/6190846/gm-uses-web-to-spread-cadillac-message-at-le-mans>.

<sup>314</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 23, 26.

<sup>315</sup> *Ibid.*, 25; and Mills, *Carroll Shelby: The Authorized Biography*, 240.



300s.<sup>316</sup> At the start, the Cobra quickly took first place in its class, and even started to compete for an overall win. Krause continued around the course unfazed as his competition fell off from mechanical failures.<sup>317</sup> However, Krause's Cobra would not finish the race and this time Shelby was to be held responsible. According to Friedman, Shelby was responsible for refueling the Cobra during a pit stop. The car was fitted with two fuel tanks so the Cobra only needed to pit once halfway through the race for fuel.<sup>318</sup> Unfortunately, Shelby did not allow enough time for the second tank to be filled and the car ran out of fuel.<sup>319</sup> Once again, the Cobra failed to cross the finish line first, but its ability to lead caught the attention of the media with journalist Frank Blunk calling the Cobra "outstanding." This type of publicity brought new customers to Shelby's door.<sup>320</sup>

While the Shelby worked out the technical issues with his Cobra, he also continued to build models for consumers. The first commercial Cobra sold in the middle of 1962 and a majority of his cars were being sold to everyday individuals and not team owners. According to Shelby's records only between ten to fifteen percent of cars his shop made were for racing.<sup>321</sup> This did not detour Shelby as he felt the Cobra was reliable enough to use either on the street or strip. Furthermore, by the end of 1962, Shelby was able to homologate and build enough cars to

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<sup>316</sup> The Sports Car Club of America defines the GT class as racecars that while heavily modified are based on production models. This means that the car is available for consumers to purchase. "Car Classifications and Groups," *Sports Car Club of America*, accessed March 21, 2017, <https://www.scca.com/pages/car-classifications-and-groups>.

<sup>317</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 23-26.

<sup>318</sup> Mills, *Carroll Shelby: The Authorized Biography*, 240; and Friedman and Christy, *Carroll Shelby's Racing Cobra*, 25-26.

<sup>319</sup> Michael L. Shoen, *The Cobra Ferrari Wars 1963-1965* (Paradise Valley, AZ: CFW, 1988), 65.

<sup>320</sup> Frank M. Blunk, "Penske Is Auto Race Victor: Driver Sets Mark In A New Ferrari," *The New York Times*, December 3, 1962, 48.

<sup>321</sup> Shelby, *The Cobra story*, 200.

move out of the prototype class and enter into the GT class.<sup>322</sup> American automotive magazines began to review his Cobra, and the September 1962 issue of *Road and Track* gave a thorough overview of the car.

During their tests, they found the car to be on par with the Corvette on the drag strip, and it superseded any other sports car at its price point of \$5,995. The braking was also a bit of surprise for their tests and they found that as easily as the car accelerated to 150-mph it had little trouble stopping at high speeds. In fact, they believed these were the best brakes they had tested. *Road and Track* also noted the reliability of the Ford engine, and stated, “Its Ford engine may not have overhead camshafts and lots of polished aluminum castings, but it pumps out the power, it is reliable, and it can be serviced in any little town or hamlet in the country.”<sup>323</sup> The automotive magazine also tested the 1962 Corvette, and based on their findings, the Cobra at 14 seconds was a full second faster down the quarter mile than the Chevy.<sup>324</sup> Shelby recognized the importance of publicity and found these positive reviews helped secure a place for his Cobra in dealerships across America. Initially he had to personally sell the car to dealers, but now they were contacting him to place orders and by the end of production in 1968, he sold 1,130.<sup>325</sup> As the 1962 season ended, Shelby and his team hoped to build upon their success, but his primary

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<sup>322</sup> Ibid., 201; and The term homologation in racing means that a car manufacturer has produced enough examples of a particular vehicle in order for it to race in varying classes. For example, in 1962 for Shelby to run his Cobra in the GT class the FIA mandated his company produce around a hundred examples of his car. “Homologation and Technical Regulations,” Racing Cars, last updated March 4, 2017, accessed March 21, 2017, <http://tech-racingcars.wikidot.com/printer--friendly//homologation>; and Shelby, *The Cobra story*, 201-202.

<sup>323</sup> “September 1962 Road & Track Issue Featuring an AC Cobra,” *Car Build Index: Car Builds, Projects, Restorations, Barn Finds and Other Cool Car Related Stories*, May 7, 2014, accessed February 12, 2017, <http://www.carbuildindex.com/27337/september-1962-road-track-issue-featuring-an-ac-cobra/>.

<sup>324</sup> Gordon Chittenden, “1962 Chevrolet Corvette,” *Car and Driver*, January 1970, accessed February 12, 2017, <http://www.caranddriver.com/reviews/1962-chevrolet-corvette-road-test-review-acceleration-and-transmissions-page-2>.

<sup>325</sup> Shelby, *The Cobra Story*, 201. “History of Cobra Classic Cars”, *Ultimate Classic Cars*, accessed April 8, 2017, <http://www.ultimateclassiccars.com/cobra-history/>.

driver Krause refused to continue along with the project.

Krause had driven the Cobra during its first race, but decided to sign with Chevy for the 1963 season. According to Friedman, there was no spite between Krause and Shelby. It came down to money and Shelby did not have the resources to pay Krause's asking price; therefore, when Mickey Thompson offered him a higher salary to race the Stingray, Krause gave little thought to leaving Shelby.<sup>326</sup> However, after Krause signed with Chevy, General Motors decided to discontinue its support for racing. As it feared the federal government's response to its growing market. By 1962, the company controlled fifty-three percent of the automotive market, and the company feared it might be broken up if it reached sixty percent. This was a real possibility as the U.S. Government had previously stepped in to divide Standard Oil.<sup>327</sup> This left Krause without a car to drive as Shelby had already moved on to others.

Shelby replaced Krause with Ken Miles who was an experienced builder and driver. Miles moved to Southern California from England during the 1950s. While not a natural born American, Miles immersed himself into American automotive culture and became a hot rodder. Prior to working with Shelby, Miles had constructed an MG-engined car and was a prominent driver in the 1,500cc class. Also, Rinsey Mills notes his contribution to Reventlow's Scarab project by designing the chassis.<sup>328</sup> Miles proved an able replacement, and helped secure the Cobra's first win.

Shelby entered two Cobras for the 1963 SCCA race opener at Riverside. For this race,

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<sup>326</sup> Mills, *Carroll Shelby: The Authorized Biography*, 241; 27; and Friedman and Christy, *Carroll Shelby's Racing Cobra*, 27.

<sup>327</sup> Robert Kibbe, "The History of GM Factory-Backed Racing: On, Off, and On Again," *Chevy Hardcore*, December 1, 2010, accessed on February 12, 2017, <http://www.chevyhardcore.com/news/the-history-of-gm-factory-backed-racing-on-off-and-on-again/>.

<sup>328</sup> Mills, *Carroll Shelby: The Authorized Biography*, 241; and Peter Vincent, *Hot Rod Garages* (Minneapolis, MN: Motorbooks, 2013), 178.

Shelby chose Miles and Dave MacDonald to represent the Cobra. Both drivers were experienced and pushed the Cobra to its limits, and during the preliminary race fought each other for first place. MacDonald ended up being too aggressive and spun out of the race, which allowed Miles the opportunity to cross the finish line unopposed. According to Mills, Shelby thought MacDonald should lead for the final race scheduled for the following day. From the onset of the race the next day, MacDonald and Miles led the field and showed little sign of slowing down. Miles' ability to regain second place after taking an early pit stop to check for a mechanical malfunction demonstrates the superior performance of the Cobra over the Stingray. During the stop, the entire field passed him, but after rejoining the race, he quickly overtook the competition and finished second behind MacDonald with more than a minute ahead of the Stingray in third place.<sup>329</sup> So confident of winning, Miles actually stopped during the race for a drink of water to taunt the other drivers. The Cobra's one-two finish and Miles' sneer demonstrated the potential of the Cobra against its domestic competition. However, Ford and Shelby did not just want their car to compete against domestic competition and sought to prove their car could win against the world's best at Daytona.<sup>330</sup>

Shelby entered three Cobras at the three-hour race at the 3.81-mile track at Daytona in 1963 driven by MacDonald, Dan Gurney, and Skip Hudson. However, only two cars were considered a potential winner as, Dan Gurney's Cobra was testing an aluminum version of the 260 engines. Unexpectedly, the experimental engine seized up during a preparation lap, but once again with only 90 minutes before the start, Shelby's hot rodders came together to change the motor. However, even with all their work, the Cobra's motor failed on the 48<sup>th</sup> lap, and as a

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<sup>329</sup> Mills, *Carroll Shelby: The Authorized Biography*, 241-242.

<sup>330</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 28-31.

result, Hudson crashed, which kept him from completing the race.<sup>331</sup> All of Shelby's hopes rested on MacDonald, but when he pulled into the pits for a simple water hose change, the car refused to restart. Shelby hardly ever took the role of a disconnected owner and oftentimes spent the races in the pits. This allowed him to participate and offer his years of experience to his crews, and at this moment, he realized the problem was that a solenoid failed to make contact. Shelby pulled a quarter out of his pocket and used it to make an electrical contact, which allowed the motor to turnover. Even with Shelby's quick fix the Cobra could not make up for the lost time and placed fourth overall; however, for his cars to even finish proved his cars could run with Ferraris or Corvettes.<sup>332</sup> *Motor Trend* notes this as the moment Shelby's rivalry with Ferrari started, which he was determined to beat at Le Mans in 1963.<sup>333</sup> Throughout the beginning of the 1960s it seemed like Ferrari could not be beaten, but Shelby hoped to bring the crown home to America.<sup>334</sup>

Shelby, with the help of Ed Hugus, a former racing driver, decided to sponsor two Cobras to race at Le Mans in 1963. Hugus played a key role with the commercial sale and distribution of Cobras beginning in 1963 and actually sold the first production Cobra.<sup>335</sup> Ford had decided not to financially support Shelby's race team in Europe, as they were already sponsoring a prototype known as the Lola Ford. This would eventually develop into the Ford GT40, which Ford would

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<sup>331</sup> Shelby, *The Cobra Story*, 235; Friedman and Christy, *Carroll Shelby's Racing Cobra*, 31-33; and William Sidney Stone, *A Guide to American Sports Car Racing* (New York: Doubleday, 1971), 174.

<sup>332</sup> Friedman and Christy, *Carroll Shelby's Racing Cobra*, 31-33.

<sup>333</sup> Christian Seabaugh, "Timeline: Carroll Shelby's Life, 1923-2012," *Motor Trend*, May 11, 2012, accessed February 12, 2017, <http://www.motortrend.com/news/carroll-shelby-life-1923-2012-timeline/>.

<sup>334</sup> Quentin Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69* (Sparkford, UK: Haynes Publishing, 2010); and Frank M. Blunk, "Shelby's Plan to Race in Europe Draws Speculation on Drivers," *The New York Times*, March 29, 1964, S13.

<sup>335</sup> Comer, *Shelby Cobra: The Snake That Conquered the World*, 21.

ask Shelby to help develop in 1965.<sup>336</sup>

Shelby brought four experienced drivers for the race, placing Bolton and Saunders in one car and Hugus and Jopp in the other. According to Shelby, the race proved to be less than spectacular as the Hugus-Jopp Cobra experienced a complete engine failure when it lost a piston. While the mechanics were able to get the car back on the track, it crashed several laps later. The Bolton-Saunders Cobra at least finished, but experienced its own set of problems as it spun on an oil slick created by an Austin Martin that had blown its motor. Thankfully, the car was able to rejoin the race and finished seventh overall.<sup>337</sup> While the Cobra had proved to be an effective design, Shelby had begun to realize its limitations to reach higher speed. Shelby American tried to make the car more aerodynamic by adding a hardtop to the Cobra. However, even with this addition it could not keep up with the competition such as Ferrari GTO. If the Cobra was to conquer Le Mans it would need a facelift.<sup>338</sup>

The redesign and development of the new Daytona Cobra coupe demonstrates the influence of hot rod culture on the Cobra. The problem with the original roadster was its open cockpit design limited the top speed of the car because of air resistance. It was impossible for a Cobra to keep up with a Ferrari 250 GTO as they could reach over 180 mph whereas a Cobra was limited to around 160 mph.<sup>339</sup> The easiest solution was to modify the car's aerodynamics and add a roof. Pete Brock was put in charge of the design. Prior to working for Shelby in 1961,

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<sup>336</sup> Shelby, *The Cobra Story*, 227; and Christian Seabaugh, "Timeline: Carroll Shelby's Life, 1923-2012," *Motor Trend*, May 11, 2012, accessed February 12, 2017, <http://www.motortrend.com/news/carroll-shelby-life-1923-2012-timeline/>.

<sup>337</sup> Shelby, *The Cobra Story*, 227; and Rinsey Mills, *Essential AC Cobra: The Cars and Their Story 1962-67* (Bideford, UK: Bay View Books, 1997), 35.

<sup>338</sup> Shelby, *The Cobra Story*, 230; and Dave Friedman, *Cobra: The Shelby American Original Archives 1962-1965* (Minneapolis, MN: Motorbooks, 2002), 57.

<sup>339</sup> Comer, *Shelby Cobra: The Snake That Conquered the World*, 69.

Brock worked at General Motors within their design studies. According to Trevor Legate, Brock incorporated some German theories of aerodynamics such as a chopped-off tail and applied them to the Cobra.<sup>340</sup> Once he completed his drawings, Shelby brought in an engineer from an airplane manufacture.

The engineer looked over Brock's drawings and felt it was impossible for this design to reach beyond 160mph. Shelby quickly inquired to explain his reasoning and the engineer proceeded to write down several equations, which thoroughly confused Shelby. However, instead of scrapping Brock's work, he trusted his gut and allowed him to continue work on the coupe.<sup>341</sup> The revised car was completed within four months and Brock proved the concept of his design during its first race at the 2000-kilometer Continental at Daytona Speedway in February 1964. Unfortunately, the car failed to complete the race because of a fire caused in part by a mechanical malfunction.<sup>342</sup> Once the experimental Cobra was retired, Ferrari went on to take first, second, and third.<sup>343</sup> However, the coupe ran the fastest lap of the day at 2:08.2 and compared to the original Cobra used twenty-five percent less fuel. Furthermore, it had a fifteen mph higher top speed over the original Cobra.<sup>344</sup> At this point, Shelby knew he could beat Ferrari at Le Mans 1964.

In 1964, the Cobra took home several championships including the United States driver

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<sup>340</sup> Trevor Legate, *Cobra: The First 40 Years* (Minneapolis, MN: Motorbooks, 2006), 96; and Sam Smith, "The Unlikely Story of the Ferrari-Beating Shelby Daytona Coupe," *Road & Track*, August 14, 2015, accessed February 12, 2017, <http://www.roadandtrack.com/motorsports/a26376/coupe-de-grace-shelby-daytona-coupe-story/>.

<sup>341</sup> Shelby, *The Cobra Story*, 229-235.

<sup>342</sup> *Ibid.*, 231-232.

<sup>343</sup> Mills, *Essential AC Cobra*, 46; and Frank M. Blunk, "Miles and Ruby Drive Ford GT to Victory in 2,000-Kilometer Daytona Race," *The New York Times*, March 1, 1965, 32.

<sup>344</sup> Shelby, *The Cobra Story*, 231-232.

and manufacturers win.<sup>345</sup> However, for Shelby, the Cobra needed to win on the world stage and so he brought two coupes to Le Mans in 1964; his hope was to finally beat Ferrari at their own game. Shelby and his team were somewhat optimistic after the first day of practice as Dan Gurney set the lap record for the GT class and reached 197-mph down the Mulsanne straight. However, Ferrari was prepared for the Daytona Coupe. Enzo Ferrari had witnessed Shelby's new coupe at Daytona, and responded by putting in a more advanced engine known as the 250 GT into all four of his cars at Le Mans. The Daytona Coupe challenged Ferrari's new cars and it seemed Shelby might actually have a chance at winning.

However, the officials disqualified the Cobra driven by Amon and Neerpasch at around midnight during the race because the pit crews had broken a rule by jumpstarting the dead battery with another battery. Le Mans race organizers are vigilant when it comes to tampering with a car once it starts the race and do not allow teams to replace batteries or alternators.<sup>346</sup> Shelby now only had a single car left. The engine in the coupe began to lose oil pressure, but Phil Remington and John Stukie were able to quickly resolve the issue and keep the car racing. Bondurant was able to fight off the Ferraris and at 4:00pm took first place in the GT class and fourth overall.<sup>347</sup> *Motor Sport* magazine noted in 1964 the Cobra simply outmatched the GTO Ferraris. Shelby and his California crew of hot rodders achieved the impossible and beat Ferrari at its own game.<sup>348</sup>

At this point in the season, there were only three races left and Shelby American could

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<sup>345</sup> Frank M. Blunk, "Jim Hall and Shelby-Ford Team Capture '64 Road Racing Titles," *The New York Times*, August 12, 1964, 27.

<sup>346</sup> Mills, *Essential AC Cobra*, 53; and Legate, *Cobra: The First 40 Years*, 50-60.

<sup>347</sup> Pat Bondurant, "1964 Le Mans," YouTube video, duration 9:40, posted February 2014, <https://www.youtube.com/watch?v=h8N1hMVGBuw>.

<sup>348</sup> *Ibid.*; and "The 24 Hours of Le Mans: Ferrari Fight Through to Win Again," *Motorsport*, July 1964, accessed February 12, 2017, <http://www.motorsportmagazine.com/archive/article/july-1964/22/24-hours-le-mans>.



win the overall Federation Internationale De L'automobile (FIA) World Championship. According to Michael Shoen, Shelby only needed to win two of three races in order take first place it total points. After each race, teams were awarded points depending on where they finished, and at the end of the season the team with the most points won. Towards the end of the season, Shelby was only 6.3 points away from beating Ferrari. However, before the race at Monza, Italy the race was called off. Shelby firmly believes that Ferrari pressured the organization to cancel the race, but to this day, it is still debated.<sup>349</sup> Whether or not Shelby is correct, his team still just barely lost in 1964, during its first full year of racing in the World Championship.<sup>350</sup> Coming in second did not sit well with Shelby and he vowed, "Next year, Ferrari's ass is mine."<sup>351</sup> Shelby was true to his word and would beat Ferrari and win the 1965 FIA World GT Championship. This was the first and only time an American team won the championship.<sup>352</sup> According to Alex Gabbard, the Ford Motor Company also saw Shelby's near win in 1964 as an opportunity to achieve victory with their struggling GT program.<sup>353</sup> For the 1965 race, Ford and Shelby would come together to challenge Ferrari, with the Daytona Coupe and GT40.

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<sup>349</sup> Pat Bondurant, "1965 FIA World Manufacturers GT Championship- Bob Bondurant," YouTube video, duration 15:46, posted March 24, 2015, <https://www.youtube.com/watch?v=SqMNR7Qe82g&t=242s>, Mills, *Essential AC Cobra*, 55.

<sup>350</sup> Mills, *Essential AC Cobra*, 55.

<sup>351</sup> R & T Staff, "Words of Wisdom From Carroll Shelby," *Road & Track*, May 14, 2014, accessed February 12, 2017, <http://www.roadandtrack.com/car-culture/interviews/a18116/words-of-wisdom-from-carroll-shelby/>.

<sup>352</sup> "History," *Bondurant Racing School*, accessed March 21, 2017, <https://bondurant.com/history/>.

<sup>353</sup> Alex Gabbard, *Ford Total Performance: The Road to World Racing Domination* (New York: HP Books, 2000), 57.

## Chapter 4: Total Performance

Shelby's relationship with Ford drastically shifted over the 1960s as he became involved with two of their most iconic projects, the Ford GT40 and Mustang. Ford wanted to win on the world stage at Le Mans and initially hired Shelby's former Aston Martin manager, John Wyer, to head the program. However, by the mid-sixties the program had little to show and after investing millions of dollars the car had yet to win a major event. Ford recognized Shelby's ability to run a racing program and hired him to head the GT40 program in 1965. While the GT40 program primarily focused on racing, the Mustang was intended to be sporty and affordable for the average consumer. Initially, Ford advertised the car as a secretary's car, but Ford Vice President Lee Iacocca saw its potential to transform into a hot rod. In order to achieve this goal, Ford once again turned to Shelby in the hopes he could improve the Mustang's performance. While the projects had different goals, Shelby used them as an opportunity to showcase his relationship with the Detroit industry and hot rod culture.

There is no doubt that Shelby had unfriendly feelings towards Ferrari, but his racing supplier, Ford actually began negotiations in 1963 to purchase the Italian car manufacturer. According to Leo Levine, the European division of Ford received a message in February from Ferrari discussing the possibility of developing a cooperative arrangement between the two companies.<sup>354</sup> Initially, Ford European forwarded the message onto Ford International, but it decided to not pursue an agreement with Enzo. Ironically, at the same time Ford International declined the offer, the Ford headquarters in Dearborn, on its own sent a letter to Enzo discussing the possibility of buying out Ferrari. Some of the top individuals within Ford such as, Lee Iacocca looked to acquire Ferrari in an attempt to increase his company's reputation. Levine

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<sup>354</sup> Leo Levine, *Ford: The Dust and The Glory A Racing History* (New York: Macmillan Company, 1968), 480.

notes this was a common tactic for American auto manufacturers as General Motors worked with Ferrari so they could in turn use their name within advertising.<sup>355</sup> By purchasing Ferrari, Ford could also easily enter into endurance racing such as Le Mans.<sup>356</sup> Ferrari had a proven record and the Italian company had won at Le Mans from 1960 to 1962.<sup>357</sup> Ferrari agreed to begin negotiations, and by April, Ford representatives were in Italy reviewing the company's inventory and assets.<sup>358</sup>

After Ford concluded its investigation of Ferrari's resources, the company looked to finalize its agreement with Enzo. At this point, Enzo was also eager to continue negotiating and outlined his offer to Ford, which included the right to use the name Ferrari and ownership of all the company's patents and engineering research. Ford would also own ninety percent of the company, with Ferrari owning the rest. Enzo would serve as the vice president of the new Ford-Ferrari brand. However, the agreement also stated that once he passed, Ford would be allowed to purchase the remaining shares. Based on Levine's assessment, Ferrari at sixty-five had no heir to take control of the company and selling the Ferrari brand would offer him the opportunity to solely focus on racing.<sup>359</sup> Historian Richard William listed other motivations for Ferrari selling the company. For one, the poor economic state of Italy made it difficult for Enzo to run his company. Secondly, Enzo was unable to balance his home and work life, and by selling the

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<sup>355</sup> Ibid., 481.

<sup>356</sup> Alex Gabbard, *Ford Total Performance: The Road to World Racing Domination* (New York: HP Books, 2000), 54.

<sup>357</sup> Quentin Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69* (Sparkford, UK: Haynes Publishing, 2010), 76.

<sup>358</sup> Levine, *Ford: The Dust and The Glory A Racing History*, 481.

<sup>359</sup> Ibid., 484-485.

company, he hoped to repair his relationship with his family.<sup>360</sup> Ford was receptive to Enzo's proposal and the lawyers from both companies worked to settle the paperwork, but as talks continued into May, Ferrari began to lose interest.<sup>361</sup>

Ferrari witnessed firsthand how Ford operated and felt the company could not accurately represent his company and carry on his legacy.<sup>362</sup> The assistant general manager of Ford, Donald Frey, quotes Ferrari's decision to walk away from the negotiating table, "My rights, my integrity, my very being as a manufacturer, as an entrepreneur, as the leader of the Ferrari works, cannot work under the enormous machine, the suffocating bureaucracy of the Ford Motor Company."<sup>363</sup> The failure to close the Ferrari deal cost Ford millions of dollars, and Ford's CEO, Henry Ford II, took Enzo's rejection personally.<sup>364</sup> Once Ferrari backed out, Henry Ford II invested into the company's own racing car known as the GT40 in hopes that he could beat Ferrari at Le Mans.<sup>365</sup> However, even with all of Ford's money, his dream of winning Le Mans could not be achieved without Shelby and his crew of hot rodders.

Initially Ford shied away from including Shelby and set out to win Le Mans on his own in 1964. Even though Shelby was not a part of the team, Ford applied his formula when shopping for a new chassis in England for a lightweight chassis for its American V8. Also, by using a developed chassis, this cut down on development costs. Ford looked at the possibility of using an English company known as Lotus to supply the body. However, the deal fell through and Ford

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<sup>360</sup> Richard Williams, *Enzo Ferrari: A Life* (London: Yellow Jersey Press, 2002).

<sup>361</sup> Levine, *Ford: The Dust and The Glory A Racing History*, 484-485.

<sup>362</sup> *Ibid.*, 484-485.

<sup>363</sup> *Ibid.*, 485.

<sup>364</sup> Colin Comer, *The Complete Book of Shelby Automobiles Cobra, Mustangs, and Super Snakes* (Minneapolis, MN: Motorbooks, 2009), 190-210.

<sup>365</sup> Gabbard, *Ford Total Performance*, 54.

turned to the Lola GT.<sup>366</sup> Eric Bradley founded Lola, and its first racing GT car was a mid-engine design and used an aluminum chassis with a Ford V8. Lola entered into Le Mans in 1963, but the car never finished the race as it crashed around the fifteen-hour mark.<sup>367</sup> Magazines across Europe, including *Motor sport* in 1965, saw Ford's attempt to shortcut their way to Le Mans as evidence that it could not be done without the painstaking process of learning through experience.<sup>368</sup> Even with Bradley's help and a \$1.7 million investment, Ford would experience several failures before they took Ferrari.<sup>369</sup>

Ford began to experiment with Bradley's design in 1964 and found that the current aluminum chassis needed to be replaced with steel. This went against Bradley's desire as steel is much heavier than aluminum and the added weight could reduce the maneuverability of the car.<sup>370</sup> There were other issues that Ford found during initial tests, including that the car lacked proper aerodynamics for higher speeds and as air moved under it, the car began to lift off the track.<sup>371</sup> As a result of their differences, Bradley canceled his contract with Ford, but Ford continued to improve upon the design of the Lola GT. Their final project still borrowed some of Bradley's original project such as the canopy doors. However, according to Adrian Streater, the

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<sup>366</sup> Mate Petrany, "How This Extremely Rare Lola Helped the Ford GT40 Win Le Mans," *Road & Track*, February 6, 2017, accessed March 21, 2017, <http://www.roadandtrack.com/car-culture/classic-cars/videos/a32524/lola-mk6-ford-gt-gt40-le-mans/>.

<sup>367</sup> Adrian Streater, *Ford GT: Then, and Now* (Dorchester, UK: Veloce Publishing Ltd, 2015), 12-14. See also Comer, *The Complete Book of Shelby Automobiles*, 193.

<sup>368</sup> "The Ford GT 40", *Motorsport Magazine*, September 1965, accessed on March 2, 2017, <http://www.motorsportmagazine.com/archive/article/september-1965/24/ford-gt-40>.

<sup>369</sup> Comer, *The Complete Book of Shelby Automobiles*, 193; Levine, *Ford: The Dust and The Glory A Racing History*, 488; and Preston Lerner and Dave Friedman, *Ford GT: How Ford Silenced the Critics, Humbled Ferrari, and Conquered Le Mans* (Minneapolis, MN: Motorbooks, 2015), 21.

<sup>370</sup> Streater, *Ford GT: Then, and Now*, 16.

<sup>371</sup> Comer, *The Complete Book of Shelby Automobiles*, 195.

body of the car Ford finished in February 1964 was entirely designed by the Ford Design Department in Dearborn. Ford named their new GT car the Ford GT40, which came from the height of the car being at 40.5 inches.<sup>372</sup>

Ford entered several of the cars into Le Mans in 1964, but none finished the race. The Ford Motor Company had experience building passenger cars and not racecars. As a result, its cars suffered from a plethora of reliability issues related to the transmission and motor. However, the GT40 showed some promise as driver Phil Hill set a new course record at 131.375-mph.<sup>373</sup> Ford needed to further refine their car and finally looked to their successful partner Shelby American to fine tune the car. During the same race at Le Mans, Shelby's Cobras not only were competitive but beat Ferraris in the same class. Shelby and the hot rodders that worked Shelby American were the missing piece in order for Ford to finally win at Le Mans.<sup>374</sup>

Since Ford's race program failed to produce any significant results, it looked towards Shelby in order to bring the project together. *The Baltimore Sun* noted Shelby's unnatural ability to bring together a project by stating, "Ask Carroll Shelby what makes a spark plug fire and he quite possibly couldn't tell you. But give him two days and he could build you a new one."<sup>375</sup> Ford fired the current project leader, John Wyer, and sent Shelby two GT40s to his shop in California. Once Shelby took control of the program, he placed Carroll Smith in charge to insure the project was completed. Smith was a long time driver and engineer, and Shelby specifically hired him to take on the project. Furthermore, Smith was acquainted with some of the best hot

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<sup>372</sup> Streater, *Ford GT: Then, and Now*, 15-16.

<sup>373</sup> Gabbard, *Ford Total Performance*, 56.

<sup>374</sup> Ibid., 57; and Quentin Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69* (Sparkford, UK: Haynes Publishing, 2010), 138.

<sup>375</sup> "Shelby Now Car Builder: First Of Ex-Racer's Autos Go On Sale This Year," *The Sun*, April 6, 1965, 27.

rod engineers in America such as Ken Miles and Phil Remington.<sup>376</sup> According to Mills, the current GT40 project was disorganized. Racing is a highly technical sport with little room for error as even today modern drag cars are constantly stripped and rebuilt for races. For example, engines used in Top Fuel drag cars are rebuilt after every lap down a quarter mile. While these motors undergo a significant more amount of stress compared to circuit racing the lifespan of any racing part is significantly reduced due to the constant wear and tear.<sup>377</sup>

In order to keep their Cobras in racing order, his team constantly refit and rebuilt the cars after every race. While an expensive and labor intensive process, this ensured the car would have the best possible odds of being competitive and completing a race; therefore, when Ford's two GT40s arrived at Shelby American the hot rodders were shocked at their deplorable condition. After their last race, instead of being loaded into a trailer or garage, the cars were left in the rain, starting the rusting process. Before Remington could even begin testing, he needed to practically rebuild the worn-out components. Once the car was in running condition, Shelby American could then focus on performance modifications that would improve the Ford GT's performance.<sup>378</sup>

Shelby American cleaned the GTs and gave them an official Shelby paint job, which consisted of a blue base with white stripes. Along with a fresh coat of paint, the cars received a new engine. The GTs received the race tested 289s, which had conquered the American and European race circuits. Once completed the cars were tested at the Riverside Raceway in California. However, even with the improved motor the car needed significantly more

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<sup>376</sup> Lerner and Friedman, *Ford GT*, 64-65; and Wyss, *Shelby: The Man. The Cars. The Legend*, 92.

<sup>377</sup> Mills, *Carroll Shelby: The Authorized Biography*, 345-346; and Jeff Huneycutt, "75 Minute Engine Rebuild- Power Play", *Hot Rod Network*, July 18, 2006, accessed on March 2, 2017, <http://www.hotrod.com/articles/top-fuel-engine-rebuild/>.

<sup>378</sup> Mills, *Carroll Shelby: The Authorized Biography*, 346; and Lerner and Friedman, *Ford GT*, 61.

development. Miles got behind the wheel and only after a couple laps returned to the pits and commented, “It’s bloody awful.”<sup>379</sup> In order to make the car corner and handle better, the hot rodders reworked the suspension to allow the car to remain stable during high-speed cornering. One of the biggest improvements was the addition of Goodyear tires over the small Dunlop that the car was shipped with.<sup>380</sup>

This is an often-overlooked component when it comes to performance as equipping a car with the right tire can make all the difference. Racing tires are often wider than normal tires and allow for more contact with the ground. This provides a car with more grip, which allows for higher speeds and stability when driving around corners. Carroll Smith breaks down the science behind tire technology in *Tune to Win*. This work digs deep into technical data behind racing tires and examines tire pressure, temperature, and even tire compound.<sup>381</sup> However, in an effort to simplify Smith’s data, *Motor Trend* in 2013, demonstrated the difference between performance and standard tires. During its tests, the cars with performance tires could round the test track 1.18 second faster per lap. This was achieved with the same driver and by only changing the tire and wheel size.<sup>382</sup> Furthermore, along with upgrading tires and suspension, Remington also modified the weight distribution by moving the oil coolers towards the rear of the car. While the hot rodders at Shelby American receive a majority of the credit for improving

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<sup>379</sup> Lerner and Friedman, *Ford GT*, 66.

<sup>380</sup> Mills, *Carroll Shelby: The Authorized Biography*, 346.

<sup>381</sup> Carroll Smith, *Tune To Win: The Art and Science of Race Car Development and Tuning* (Fallbrook, CA: Aero Publishers, Inc., 1978), 13.

<sup>382</sup> Motor Trend Channel, “Modifying the 2013 Subaru BRZ! The First Change a Driver Should Make-Wide Open Throttle Episode 39,” YouTube video, duration 10:13, posted November 1, 2012, <https://www.youtube.com/watch?v=QQwWdZ00HYQ>.



the GT40, their mission needed to be supported by the automotive industry.<sup>383</sup>

Shelby American did a significant portion of the necessary retooling for the GT40, but it was not primarily a hot rodders' project. According to Bob Bobdurant, "Phil Remington is the father of making things work." It was not a solo project and Ford Motor Company played a role beyond just a financier. It was the combination of Ford and Shelby coming together that produced a winning sports car. Shelby stated in 2005, "We'd been doing pretty well with the Cobras, but we knew we had to go to a midship-engined car to beat Ferrari."<sup>384</sup> Ford was eager to supply the resources to Shelby, and it sent a team from the aeronutronics department at Philco-Ford with Shelby when he took the car to the course at Willow Springs, California.<sup>385</sup> According to Preston Lerner, Philco-Ford was a division of the Ford Motor Company, which held contracts with U.S. Government including NASA and the Air Force.<sup>386</sup> However, instead of designing a structure to fly through the air, they worked to keep the GT40 on the ground.

During this time at Ford Dearborn Automotive Testing Ground, the company placed the current iteration of the GT40 into its wind tunnel and discovered poor aerodynamic were robbing the car of seventy-six horsepower. While Remington and Shelby American had a long list of experienced hot rod mechanics, some tests cannot be conducted in a garage or at the track.<sup>387</sup> Furthermore, along with supplying engineers and wind tunnels, Ford also provided parts such as ring and pinion gears to act as placeholders while the German company, ZF, built a stronger set

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<sup>383</sup> Mills, *Carroll Shelby: The Authorized Biography*, 346.

<sup>384</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 87.

<sup>385</sup> Mills, *Carroll Shelby: The Authorized Biography*, 346.

<sup>386</sup> Lerner and Friedman, *Ford GT*, 67.

<sup>387</sup> *Ibid.*, 67.

of gears.<sup>388</sup> The relationship that had developed between Ford and Shelby allowed the GT40 project to come together quickly and efficiently. It was a combination of the two industries and cultures, which brought the GT40 to its first victory at Daytona.

Shelby American and Ford finished retooling the GT40 in time for the start of the 1965 race season. The season opener was at Daytona with the entire race lasting about twelve-hours. While Enzo Ferrari did not personally send a car to Daytona, he sent John Surtees there to represent some of the best of Ferrari's cars with the 330Ps.<sup>389</sup> According to Lerner, the 330p was equipped with 410 horsepower motor and had a suspension in part based off of their F1 car.<sup>390</sup> For this race, Shelby and Ford sent two GT40s one designated GT-103 piloted by Ken Miles and Lyod Ruby and the other GT-104 piloted by Bob Bondurant and Richie Ginther.

Prior to the race, Ferrari set the fastest lap beating the quickest GT40 by 1.8 seconds. However, the GT proved to be more reliable at Daytona as all the Ferraris failed to complete the race due to suspension problems. Bondurant and Ginther were leading after the Ferraris broke down, but during a driver change their starter failed, and they fell twenty-seven minutes behind. However, Miles and Ruby were right behind to take first place and drove, and the first GT40 to victory. Furthermore, Bondurant and Gintehr also demonstrated the true potential of the GT40 by coming back and finishing third.<sup>391</sup> This win also showcased the power of a partnership between Ford and Shelby as the first five cars to cross the finish line were powered by Ford and refined

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<sup>388</sup> Mills, *Carroll Shelby: The Authorized Biography*, 346; and "Ford GT 40", *ZF Motion and Mobility*, accessed March 5, 2017, [http://www.zf.com/corporate/en\\_de/products/product\\_range/zf\\_tradition/tradition\\_brands/ford/ford.html](http://www.zf.com/corporate/en_de/products/product_range/zf_tradition/tradition_brands/ford/ford.html).

<sup>389</sup> Lerner and Friedman, *Ford GT*, 68.

<sup>390</sup> *Ibid.*, 68-69.

<sup>391</sup> Lerner and Friedman, *Ford GT*, 70-71; and Gabbard, *Ford Total Performance*, 58-59.

by Shelby.<sup>392</sup> Winning Daytona was an enormous accomplishment, but they looked to Le Mans to solidify their reputation as a race team.<sup>393</sup>

Ford and Shelby placed a lot of faith on winning Le Mans in 1965, and Henry Ford II wanted to witness in person his GT40 finally beating Ferrari. Ford sent six Ford GT40s, to compete against twelve of Ferrari's best including the newly homologated 275GTB. Even though Shelby American and Ford had worked together on the project, the hot rodders at Shelby American felt Ford did not put in the same effort.<sup>394</sup> Rinsey Mills showcases their feelings by quoting Remington:

We'd got the coupes to a pretty good level by that time and done what we could with the GT40s, but they were still under development and we hadn't even had time to run consumption tests on the new car. I wasn't too happy with some of the stuff that had come through from Ford at that time and a couple of the guys I knew there in engineering had told me they'd been told to concentrate on the Indy program and ended up spending way too much time on that.<sup>395</sup>

During the testing, prior to the race, two of the cars equipped with the larger 427 cubic inch engine were still experiencing aerodynamic issues. Remington had a long history of developing quick fixes from his hot rodding days, and he tried to increase the stability by adding fins and rear spoiler. His methods worked and the Fords were able to continue qualifying, one of the GT40s had secured top of the pole position.<sup>396</sup> Phil Hill had set the time to beat at 3:30

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<sup>392</sup> Frank M. Blunk, "Miles and Ruby Drive Ford GT to Victory in 2,000-Kilometer Daytona Race," *The New York Times*, March 1, 1965.

<sup>393</sup> "Carroll Shelby: A Tough Texan Throws His Chips In With Ford," *The New York Times*, June 19, 1966, 184.

<sup>394</sup> Mills, *Carroll Shelby: The Authorized Biography*, 377-379.

<sup>395</sup> *Ibid.*, 378.

<sup>396</sup> *Ibid.*, 379-381.

seconds with an average speed of 141.37 mph.<sup>397</sup> During the race, the GT40s outpaced their Ferrari counterparts, but as the race continued Henry Ford II saw his chance for glory begin to fade as three of the six cars broke down. The GT40s began experiencing transmission and engine issues, which allowed the Ferraris to claim the first through fifth place. Eventually, all of Henry's GT40s were parked and the only Ford to complete the race was the Shelby Daytona coupe, which finished in 8<sup>th</sup> place.<sup>398</sup> Even after spending \$6 million and losing once again to Ferrari, Henry Ford II did not lose faith in the program and sent a message to all of his racing departments that read "You better win" in 1966.<sup>399</sup>

Leading up to the start of Le Mans 1966, Shelby American and Ford began to tear down the GT40s and investigate the point of failure in each car. Remington concluded the primary issue was a quality control with Ford. Engineers at Ford agreed with Remington's assessment, which caused the company to refocus on the GT40 program and place their bet on their NASCAR tested 427 engines. However, the entire failure cannot be blamed on Ford as even Mills suggests part of the blame was Shelby American's inability to quickly design and test new parts. As a result, Ford brought in several other automotive builders including John Holman the owner of Holman & Moody. Their expertise with the big 427 cubic inch engine proved crucial, and they helped Shelby American retool the motors to optimize them for Le Mans. Holman & Moody were able to retune the cars so they could handle the rigors of running for 24 hours at Le Mans.<sup>400</sup>

The introduction of Holman & Moody caused a bit of an internal rivalry with Shelby

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<sup>397</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69*, 175-176.

<sup>398</sup> Ibid., 202; and Mills, *Carroll Shelby: The Authorized Biography*, 379-381.

<sup>399</sup> Philip Delves Broughton, "Clash of the Titans", *Mr. Porter*, accessed on March 2, 2017, <https://www.mrporter.com/journal/the-read/clash-of-the-titans/39>.

<sup>400</sup> Lerner and Friedman, *Ford GT*, 105-107; and Mills, *Carroll Shelby: The Authorized Biography*, 389.

American, but their addition only strengthened the bond between Detroit Industry and hot rod culture. NASCAR originated on the East Coast with bootleggers modifying their cars to outrun the law during prohibition in the 1920s. Bootleggers applied some of the same principles to their cars as hot rodders; therefore, the automotive industry and hot rod culture came together to produce a 427ci engine with less horsepower at around 450 but one that could handle the 24 hours of Le Mans.<sup>401</sup> These numbers would continue to improve and according to *Motorsport Magazine* in 1966, the Ford GT40 was rated at 475-horse power.<sup>402</sup> This version differed heavily from the original GT40, so it was designated as the MKII. It proved to be a competitive design and at Sebring 1966, Ford claimed first, second, and third. However, Henry Ford II's, "You better win" message did not concern Sebring, but Le Mans, so the job could not be completed until they won Le Mans. The personnel at Ford took Henry Ford's directive seriously and fielded thirteen cars to compete at Le Mans in 1966.<sup>403</sup>

Ford and Shelby were optimistic of their chances at Le Mans in 1966, their main competitor Ferrari decided to forgo testing their cars at Le Mans and instead ran at Monza, Italy. Along with Shelby and his crew of mechanics, Ford sent around a hundred engineers, mechanics, and personnel to oversee the project. In order to meet the American threat Ferrari sent two P3s and allowed a private team know as North American Race Team (NART) to privately sponsor an

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<sup>401</sup> Ibid.; Mills, *Carroll Shelby: The Authorized Biography*, 389; Rick Houston, "Nascar's Earliest Days Forever Connected to Bootlegging", *NASCAR*, November 1, 2012, accessed on March 2, 2017, [http://www.nascar.com/en\\_us/news-media/articles/2012/11/01/moonshine-mystique.html](http://www.nascar.com/en_us/news-media/articles/2012/11/01/moonshine-mystique.html); and Wyss, *Shelby: The Man. The Cars. The Legend*, 115-117.

<sup>402</sup> "Le Mans Test Week-end," *Motorsport Magazine*, May 1966, accessed on March 2, 2017, <http://www.motorsportmagazine.com/archive/article/may-1966/54/le-mans-test-week-end>.

<sup>403</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 116; Gabbard, *Ford Total Performance*, 60; and Philip Delves Broughton, "Clash of the Titans", *Mr. Porter*, accessed on March 2, 2017, <https://www.mrporter.com/journal/the-read/clash-of-the-titans/39>.

open cockpit P3 and P2.<sup>404</sup> Ford set several records during the testing, and *The Washington Post* reported in 1966 that the GT40 was the first car to ever-average 140mph around the course.<sup>405</sup> While Ford would have the upper hand in numbers and track testing, their weekend was not without disaster.

One of Shelby's old competitors, Walt Hansgen, had joined the racing team and was out testing the MKII prior to the race. Hansgen was testing the car while it was raining and pushing the car to its limits. Shelby recognized the danger Hansgen was placing himself in and instructed him to slow down, but every lap his times only went down from 3:59 to 3:46. Unfortunately, Hansgen would pay with his life for his overconfidence. *Autosport* contributor Gregor Grant recounted the car lost control and slammed into the wall at around 120mph. Rescue crews airlifted Hansgen to a nearby army hospital, but he never regained consciousness and was taken off life support five days later. It was later revealed Hansgen's car had lost control due to sand being left on the track in preparation for a repair project.<sup>406</sup> While tragic, Hansgen's death was an accepted risk when racing and hot rodders along with the Detroit Industry knew the dangers of racing; so, the project continued with little interruption.

Ford's win at Sebring was a foreshowing of Le Mans in 1966, as the GT40 took first, second, and third once again with Shelby American's car coming in first and second.<sup>407</sup> *The New York Times* stated this was the first win for an American car and finally ended Ferrari's six-year

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<sup>404</sup> Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69*, 217; and Philip Delves Broughton, "Clash of the Titans," *Mr. Porter*, accessed on March 2, 2017, <https://www.mrporter.com/journal/the-read/clash-of-the-titans/39>.

<sup>405</sup> "Ford Breaks Record in Le Mans Test," *The Washington Post*, April 4, 1966, C2.

<sup>406</sup> Lerner and Friedman, *Ford GT*, 128; and Mills, *Carroll Shelby: The Authorized Biography*, 410.

<sup>407</sup> Ed Forster, "A Look Back at the 1966 Le Mans 24 Hours," *Motorsport Magazine*, May 5, 2016, accessed on March 2, 2017, <http://www.motorsportmagazine.com/opinion/le-mans/look-back-1966-le-mans-24-hours>.

reign at Le Mans.<sup>408</sup> There was little hope for Ferrari as each one of their cars succumbed to a mechanical issue or was just flat out outperformed by the Fords. From the very start, the MKII led the race and never gave it up. This was an impressive accomplishment for the GT40 program, and Henry Ford II finally had his win, but it also demonstrates the difference between big business and hot rod culture.<sup>409</sup> Towards the end of the race, Ken Miles was in the lead, but Henry Ford told Shelby that he wanted all three cars to finish at the same time. Ford wanted the press to see all three cars win together in an effort to further publicize their achievement. Shelby agreed to go along with Ford and instructed his driver, Ken Miles, to hold off to allow the other two GT40s to catch up. *Motorsport* magazine in 1966 described the Ford victory, “It was indeed impressive and undisputed victory”.<sup>410</sup> *Autoweek*, echoed this feeling by stating, “The splendid sight of the irresistible phalanx of MK IIs crossing the line in formation made it abundantly clear to the world who had won Le Mans.”<sup>411</sup> However, this publicity gimmick went against the sport of racing and ultimately hot rod culture.

Racing is about being the fastest and outdriving the competition. Furthermore, if Miles was allowed to continue driving, he would have been the first person to win the Triple Crown. No driver had ever won Daytona, Sebring, and Le Mans in the same year and unfortunately, Miles had his chance taken away for a public relations stunt.<sup>412</sup> For the rest of his life Shelby

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<sup>408</sup> William N. Wallace, “Ford Glories in 1,2,3 Le Mans Placing Despite Mix-Up at the Finish Line: M'laren, Amon Named Winners,” *The New York Times*, June 20, 1966, 57.

<sup>409</sup> Gabbard, *Ford Total Performance*, 62.

<sup>410</sup> “Le Mans 24 Hours: An American Victory,” *Motorsport Magazine*, accessed on March 2, 2017, <http://www.motorsportmagazine.com/archive/article/july-1966/18/le-mans-24-hours>.

<sup>411</sup> Ammar Khan, “Winning Le Mans,” *Ford Blog*, July 22, 2015, accessed on March 2, 2017, <http://blog.ford.ca/winning-le-mans/>.

<sup>412</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 116; and Mills, *Carroll Shelby: The Authorized Biography*, 428.

regretted allowing Ford to dictate the finish. Shelby stated,

I've regretted it ever since but I went along with what they wanted. The way it was put to me right off, or how I saw it, was that what cars we had left running at the finish would close up and go across together. Then when I realized what they were really trying for I did nothing. I didn't defend Ken's position, even when they came out with that stupid crap about him starting in front, which they said meant he'd have to be that way at the finish – and he was my friend. I still think to this day he may have been a whole lap ahead and I tried to prove it at the time but couldn't – the Le Mans people ended up by telling me they'd lost our lap records.<sup>413</sup>

After Ford and Shelby won Le Mans in 1966, European magazines began to chip away at the unique combination of hot rodders and Detroit industry. *Motorsport* published an article outlining Ford's win as proof anyone can win if enough money is spent. Also, the article pointed out while the cars were from American companies they were mostly piloted by New Zealanders and an Englishman.<sup>414</sup> The only way to prove that Ford's victory was legitimate was to come back next year to defend its title.<sup>415</sup>

In order to remain at the top, Ford's internal race development team along with Shelby American continued to develop the GT40 platform. Even though the MKII version proved to be an effective car, it was starting to age and so a new version known as the J-car was being tested as early as 1966. According to the Shelby American Collection, this car only shared the engine from the MKII, and overall was around 300 pounds lighter than the previous car. The car saved weight by applying aircraft technology such as honeycombed aluminum chassis parts.<sup>416</sup> This

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<sup>413</sup> Mills, *Carroll Shelby: The Authorized Biography*, 428.

<sup>414</sup> "Le Mans 24 Hours: An American Victory," *Motorsport Magazine*, accessed on March 2, 2017, <http://www.motorsportmagazine.com/archive/article/july-1966/18/le-mans-24-hours>.

<sup>415</sup> Gabbard, *Ford Total Performance*, 63.

<sup>416</sup> Frank Barrett, "Shelby Cars in Detail, Cars of the Shelby American Collection," *Shelby American Collection*, accessed on March 2, 2017, <http://shelbyamericancollection.org/cars/1967-ford-gt40-mk-iv-j-7/>; and Karl E. Ludvigsen, *The Inside Story of The Fastest Fords: The Design and Development of the Ford GT Racing Cars* (Torino: Style Auto Editrice, 1971), 50.



design reduced the weight of the car so it could achieve a faster time around a course. This resulted in a three second faster lap during testing.<sup>417</sup> However, the design proved to be inadequate for racing as the car came apart during testing and killed Ford's premier driver and hot rodder Ken Miles at Riverside, California. According to Mills, Miles was testing the transmission and between laps was tweaking the carburetor. Based on the after crash assessment, the front part of the chassis broke apart which took all control of the car away from Miles. He was unable to slowdown for turn nine and went down a bank where his car flipped twice killing him instantly.<sup>418</sup> Shelby not only lost his best driver but more importantly his friend, and after the accident, he commented Miles was, "The greatest test driver in the world. He was the backbone of our program...the guy who rode shotgun for us when things were tough."<sup>419</sup> While Ford and Shelby were committed to developing faster cars, the problem for Shelby was Ford's attempt to sidestep its fault within the crash.

Once again, Ford was focused on public image and overall sales. Miles's death was bad publicity for Ford as *The New York Times* reported the newly developed Ford lost control during testing.<sup>420</sup> Ford primarily blamed the accident on driver error, and it wanted to keep bad press away from its design. There was a massive push towards improving safety within the automotive industry with the passing of the 1966 Motor Vehicle Safety Act. The act set up the National Highway Safety Administration, which pushed automakers to make drastic changes to improve the safety of their vehicles. These included door latches, padded dashboards, and improved

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<sup>417</sup> Gabbard, *Ford Total Performance*, 65.

<sup>418</sup> Mills, *Carroll Shelby: The Authorized Biography*, 431-432.

<sup>419</sup> *Ibid.*, 441.

<sup>420</sup> "Miles Killed in Crash at Riverside Raceway," *The New York Times*, August 187, 1966, 59.

brakes.<sup>421</sup> For Ford to have a driver die due to unsafe construction could influence auto sales. Ford mentioned in an interview, the whole point of racing was to ultimately develop safer cars for consumers.<sup>422</sup> As a result, Ford looked to blame everything but its car, and even concluded in its report that at 47, Miles was considered an older driver.<sup>423</sup> Ford and Shelby continued their partnership, but it would be Shelby's last year on the GT40 project. Shelby stated in an interview that unnamed individuals were complaining that as an outside company Shelby American was getting preferential treatment over its other divisions. As a result, Shelby felt he could not continue within the program after 1967.<sup>424</sup>

Prior to Le Mans in 1967, Ford and Shelby American worked to refine their J-Cars and GT40 MKII both in reliability and safety. They added roll cages from their NASCAR program in order to help protect the driver in case of a rollover. Furthermore, instead of four-point seat belts engineers added five point seatbelts to all cars. The five-point belt adds a strap between the driver's legs, which keeps them from sliding out during an accident. According to Mills, this simple addition would have prevented Miles from being ejected from the vehicle.<sup>425</sup> Once the safety and performance upgrades were added to the MKII and J-car, Shelby American took over and began road testing at Daytona and here they encountered Ferrari's team preparing its new car for Le Mans. Ferrari had set out to reclaim the crown and had refined its 330P and P4 car and

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<sup>421</sup> Brian Ladd, *Autophobia: Love and Hate in the Automotive Age* (Chicago: University of Chicago Press, 2008). 55-63.

<sup>422</sup> Joseph C. Ingraham, "Ford to Expand Its Auto Racing Program Next Year at Cost of \$10-Million," *The New York Times*, July 28, 1966, 28.

<sup>423</sup> Mills, *Carroll Shelby: The Authorized Biography*, 442.

<sup>424</sup> WheelsTV, "Carroll Shelby: An Interview with the Snake," YouTube video, duration 1:01:58, posted April 14, 2015, <https://www.youtube.com/watch?v=4hNoWuTvhgQ>.

<sup>425</sup> *Ibid.*, 444; and Lerner and Friedman, *Ford GT*, 161.

added a more powerful 4-liter V12, which was rated at 450 horsepower.<sup>426</sup> However, Ford and Shelby American also worked to increase the power of MKII and by the start of Le Mans 1967, the engine was putting out closer to 530 horsepower. Ford hoped their cars could compete against the new Ferraris at Daytona.<sup>427</sup>

At Daytona, the Ferrari P3 and P4 outperformed the current GT40 MKII. While the GT40s averaged slightly faster lap times, they proved less reliable. Before the race finished, all six of the Ford GT40 were out due to mechanical problems mostly related to transmission issues. The mechanics desperately tried to keep the cars on the road, but they could not overcome the constant issues and the cars were retired leaving Ferrari an open road to the finish.<sup>428</sup> Furthermore, to add insult to injury *The Washington Post* noted that the three leading Ferrari's mimicked Ford's Le Mans finish by crossing at the same time. At Daytona, the fastest Ford finished 150 miles behind the leading Ferrari.<sup>429</sup> It was clear to Shelby that in order for Ford to remain competitive they would need to develop a new version of the GT40. Once again, the hot rodders of Shelby American would come together with Detroit industry to create a new car.<sup>430</sup>

After Shelby and Ford's failure at Daytona, Shelby American went to work refabricating the J-car. Shelby brought along some of his best hot rod mechanics, including Remington to oversee the project and two of his body fabricators Dennis Gragg and Bill Eaton. Within a couple weeks this team overhauled the design of the current J-car. They revised some of the

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<sup>426</sup> Mills, *Carroll Shelby: The Authorized Biography*, 445.

<sup>427</sup> *Ibid.*, 448.

<sup>428</sup> Mills, *Carroll Shelby: The Authorized Biography*, 448-450; and Gabbard, *Ford Total Performance*, 65.

<sup>429</sup> "In 24-Hour Daytona Race Ferraris Score 1-2-3 Sweep," *The Washington Post, Times Herald*, February 6, 1967, D1.

<sup>430</sup> Mills, *Carroll Shelby: The Authorized Biography*, 448-450; and Gabbard, *Ford Total Performance*, 65.

aerodynamics of the car, which helped air travel around the car, and enlarged the wheel wells in order to permit quicker tire changes. The team was able to reduce the amount of drag on the car almost a hundred pounds at around 120 mph. Even though Mills primarily focuses on Shelby American's contribution, it is important to note Shelby's shop was being supported by Ford. For example, a lot of the design changes took place in Ford's wind tunnel facility, which sped up testing and allowed the team to fine tune the ascetics of the car. Ford designated this new version of the GT40, the MKIV.<sup>431</sup> While Ford respected Shelby's work, the company had invested too much into the program to replace the MKII, so in order for the MKIV to race at Le Mans it had to prove it was faster.<sup>432</sup>

The MKIV made its debut at Sebring raceway in Florida, but Ferrari decided not to send any cars to; so, it would be set against the MKII. Shelby American's ability to refine a racing car was quickly recognized during qualifying as the MKIV outpaced ever car and set the fastest lap of the day at 2 min 48 sec, whereas as the MK II completed the same course in 2 min 53.6 sec. During the race, the MKIV had little trouble repeating its qualifying pace and outmatched every car on the track. By the end of the race, it was calculated that the MKIV completed 238 laps, which was 10 more than the MKII. This proved to Ford the car could be competitive at Le Mans and could defend its title.<sup>433</sup>

Even after proving the car could win, Ford and Shelby American continued to prepare for Le Mans 1967. By race day, the seven-liter engines were pushing close to 500 horsepower, which was over fifteen more than the previous year. Durability testing had also shown the cars

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<sup>431</sup> Mills, *Carroll Shelby: The Authorized Biography*, 450.

<sup>432</sup> Ibid.; and Lerner and Friedman, *Ford GT*, 182.

<sup>433</sup> Mills, *Carroll Shelby: The Authorized Biography*, 452.

were reliable enough for Le Mans, as previous results showed the engine could last over forty-eight hours at close to full throttle.<sup>434</sup> Eleven cars in the starting field including four MKIV represented Ford and Shelby at Le Mans. In response, Enzo Ferrari sent nine, which included the V-12 330 P4. Ferrari held a lot of pride for his company's hand-built cars and looked negatively on Ford's effort to outsource their production in order to complete. However, even with P4's 450-horsepower engine, it could do little to keep up the MKIV. Even prior to Le Mans, Enzo stated, "For three years I have been forecasting the present situation and I did everything I could to prevent it."<sup>435</sup> Ferrari's prediction was correct, and the qualifying rounds demonstrated the vast difference in performance. The fastest MKIV finished a lap in 3 min 24 sec and the Ferrari only achieving a 3 min 28 sec.<sup>436</sup> If the Ford's could keep their pace and the cars hold together Henry Ford II would once again walk away with a Le Mans crown. However, Le Mans rarely goes the way a team expects, and teams have to expect the worst when racing on this legendary course.<sup>437</sup>

Initially, the race went Ford's way, and by the twelfth hour, they had the top three spots, but at that moment, their luck drastically shifted. Ford lost three of their GT40s in a single accident. *The New York Times* described how two Fords sideswiped the GT40 in second place and sent the driver, Mario Andretti, to the hospital.<sup>438</sup> As a result, Ford had all of their hopes for

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<sup>434</sup> Lerner and Friedman, *Ford GT*, 193-196.

<sup>435</sup> "Ferrari Says European Racing Doomed Before U.S. Steamroller," *The Washington Post, Times Herald*, March 24, 1966, C5.

<sup>436</sup> Mills, *Carroll Shelby: The Authorized Biography*, 458-460; Spurring, *Le Mans: The Official History of the World's Greatest Motor Race 1960-69*, 267; Gabbard, *Ford Total Performance*, 67; and Williams, *Enzo Ferrari: A Life*, 246.

<sup>437</sup> Gabbard, *Ford Total Performance*, 68; and Mills, *Carroll Shelby: The Authorized Biography*, 460-461.

<sup>438</sup> "Foyt and Gurney Pilot Ford to Victory at Le Mans, Smash Distance Record," *The Washington Post, Times Herald*, June 12, 1967, D1.

winning rested on single MKIV, which was in first place, but by the fourteenth hour had three Ferraris behind it. Unfortunately for Ferrari, the Shelby American number one MKIV driven by Dan Gurney and A. J. Foyt never let up and continued to set new distance records and speed records at an average speed of 135.482 mph and 3,252.567 miles.<sup>439</sup> Gurney recounts his win at Le Mans by stating in an interview, “our philosophy was it’s not a race, but an endurance contest.”<sup>440</sup> The MKIV outperformed Ferraris and Foyt stated, “We were never really pushed.”<sup>441</sup>

After Ford’s second win, the FIA, which governs the race at Le Mans set out to constrain Ford’s ability to race their seven-liter car by limiting engine displacement to five liters. This in effect killed the MKIV program, but Ford would go back to win Le Mans in 1968 and 1969.<sup>442</sup> The one notable difference is that Shelby and his company Shelby American decided to end their partnership with Ford’s Le Mans program. Part of the problem for Shelby was as the automotive industry progressed with greater regulations it began to hinder his ability to effectively combine the hot rod culture and Detroit industry.<sup>443</sup> Although Shelby no longer worked on the GT40 program, he became more fully involved with Ford’s new project, the Mustang. While Shelby did not participate in the design process, Ford did ask him to help improve the performance of the Mustang. By doing so, it allowed everyday Americans to participate in hot rod culture with the reliability of Detroit industry.

The Ford Mustang emerged out of the 1920s and 1930s car culture. By the 1930s the car

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<sup>439</sup> Gabbard, *Ford Total Performance*, 68; and Mills, *Carroll Shelby: The Authorized Biography*, 460-461.

<sup>440</sup> WheelsTV, “Carroll Shelby: An Interview with the Snake.”

<sup>441</sup> “Foyt and Gurney Pilot Ford to Victory at Le Mans, Smash Distance Record,” *The Washington Post, Times Herald*, June 12, 1967, D1.

<sup>442</sup> Gabbard, *Ford Total Performance*, 69-70.

<sup>443</sup> Mills, *Carroll Shelby: The Authorized Biography*, 468.

became more than a means of freedom, but a way to express an individual's personality. One of the biggest contributors to expansion of car modification was World War II. The United States military drafted a large number of men, and as they returned home from the war many looked for an outlet, and many turned to cars.<sup>444</sup> A new subset within car culture started in California, known as hot rodding, but after World War II, it spread to the rest of the country. Returning soldiers had the money to spend and the technical know how to work on and modify cars.<sup>445</sup> The hot rodding market also spread to a wider audience after World War II, but with each region adding their own twist. Midwest hot rodders liked to work with coupes, sedans, and convertibles, whereas, Southern California used roadsters.<sup>446</sup> Over the course of the 1950s, Ford took note of the hot rod culture and saw a need for an inexpensive, but powerful cars that could tap into this new market. Ford began experimenting with the existing Falcon, and started working on the Mustang, which eventually became America's thoroughbred racehorse.<sup>447</sup>

Ford introduced the Mustang in early 1964 and acutely listened to the trends in the market. Lee Iacocca, a Ford executive, stated that the Mustang would embody, "more things to more people than any other automobile on the road."<sup>448</sup> Ford allowed customers to choose from a list of forty different options ranging from power steering, tinted glass, vinyl roof, and even wheel designs. These options allowed customers to individualize their car and make it their

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<sup>444</sup> WyoTech, "A Short History of the American Hot Rod," accessed on May 5, 2016, <http://automotivetechnology.wyotech.edu/articles/short-history-of-the-american-hot-rod>.

<sup>445</sup> Ibid.

<sup>446</sup> David N. Lucsko, *The Business of Speed: The Hot Rod Industry in America, 1915-1990* (Baltimore, The Johns Hopkins University Press, 2008), 69.

<sup>447</sup> Michael L. Berger, *The Automobile in American History and Culture: A Reference Guide* (Santa Barbara: Greenwood, 2001), 154.

<sup>448</sup> Bradford Wernle, "Mustang: In '64, a Crisp, New Design Won Baby Boomers' Hearts; Ford Honors the Past, Launches a New Pony for a Shifting Market," *Automotive News* 88:6616 (April 14, 2014): 25.

own.<sup>449</sup> The Mustang attracted two important markets: the baby boomers and their parents. Older parents liked the cars' sporty feel, and it offered them the ability to break away from the four-door sedan. The car was relatively cheap, with the base six-cylinder car selling for \$2,368.<sup>450</sup> Americans in 1964 earned on average around \$4,500 per year; so, the Mustang was an attainable goal.<sup>451</sup> The Mustang was a great value, but Ford also did an astounding job of advertising for the car by allowing journalists a chance to drive the car and also unveiling it at the World's Fair in New York on April 13, 1964.

In order to drum up interest before the Mustang's debut at the World's Fair, Ford sent around 11,000 press kits to journalists and news organizations from Canada to Mexico. Furthermore, Iacocca invited around a hundred and fifty reporters to tour its display. After the tour, he handed seventy-five keys out for them to drive the car back to Dearborn, Michigan. It was here that the Mustang received its first award from Tiffany and Company, the Tiffany's Gold Medal Award for excellence in design.<sup>452</sup> Ford wanted to generate interest and strategically planned revealing the car at the World's Fair.

Ford deliberately unveiled their new Mustang at the World's Fair because it wanted to convey the message of innovation and high-tech. Part of the theme at the World's Fair in 1964 was to showcase what life would be like in the future. At a Bell South Pavilion, it displayed a "picturephone" that allowed callers to see each other face to face. Also, at the National Cash Register (NCR) pavilion their engineers debuted a computer that could answer scientific

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<sup>449</sup> Randy Leffingwell, *Mustang* (New York: Crestline, 2010), 67.

<sup>450</sup> Robert Cumberland, "1964 ½ Ford Mustang the Original Pony Car Was the Right Car for the Right Time," *Automobile Magazine* 25:8 (November 2010): 22.

<sup>451</sup> "Current Population Reports: Consumer Income Families and Persons in the United States 1963," accessed on May 5, 2016, <https://www2.census.gov/prod2/popscan/p60-043.pdf>.

<sup>452</sup> Leffingwell, *Mustang*, 73.



questions and interact with guests.<sup>453</sup> The Mustang made its debut among the inventions of the future, but unlike the other items, people could actually buy the Mustang. Another innovative sales technique was that Ford actually bought ad space on every network, ABC, CBS, and NBC. Everyone watching their TVs at home was forced to watch Ford's unveiling because those were the only three channels at the time. As a result, 29 million people saw the Mustang's debut at the fair.<sup>454</sup> The ad campaign worked and to continue the momentum Ford placed 2,600 articles in newspapers and magazines that specifically focused on the all-new Mustang.<sup>455</sup> Americans fell in love with the car, it became an instant classic. Dealerships even had a difficult time keeping up with demand.

The Mustang went on sale on April 17, 1964. Crowds formed around showrooms across the country. A dealership in Pittsburgh was in the process of washing and preparing its only Mustang for the lot, but so many people showed up and surrounded the car that it never made it out of the showroom.<sup>456</sup> Another dealer in Texas auctioned his final Mustang, and the winning bidder slept in the car until his check cleared the following day.<sup>457</sup> Ford recorded 22,000 orders within the first day of going on sale, and by the end of the year, it sold 418,812 cars.<sup>458</sup>

Iacocca and his design team accurately predicted the market. However, Iacocca wanted to include the Mustang within the company's total performance focus. In order to make the

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<sup>453</sup> "1964 World's Fair Tech Predictions Had Some Hits, Misses," CBS News, April 22, 2014, accessed on May 5, 2016, <http://www.cbsnews.com/news/1964-worlds-fair-tech-predictions-had-some-hits-misses/>.

<sup>454</sup> Leffingwell, *Mustang*, 72.

<sup>455</sup> "Remarks by L.A. Iacocca Mustang National News Conference New York, New York April 13, 1964," accessed on May 5, 2016, [https://media.ford.com/content/dam/fordmedia/North%20America/US/2013/08/Mustang50/Iacocca\\_Speech-Mustang%20Intro.pdf](https://media.ford.com/content/dam/fordmedia/North%20America/US/2013/08/Mustang50/Iacocca_Speech-Mustang%20Intro.pdf), 5.

<sup>456</sup> Leffingwell, *Mustang*, 73.

<sup>457</sup> *Ibid.*, 74.

<sup>458</sup> *Ibid.*, 70.

Mustang into a muscle car, Iacocca went to Shelby to see what Shelby American could do with the platform. Unfortunately, Shelby was not eager to take on the project and later recounted: "In 1964, when Lee Iacocca said, 'Shelby, I want you to make a sports car out of the Mustang,' the first thing I said was, 'Lee, you can't make a race horse out of a mule. I don't want to do it.' He said, 'I didn't ask you to make it; you work for me.'"<sup>459</sup> With that admonition, Shelby went to work.

Ford wanted Shelby to adopt the Mustang in the Sports Car Club of America (SCCA), but there were class rules he needed to follow. Shelby could either modify the engine or suspension, but not both. Accordingly, he decided to work on the handling of the car and put in the K-code motor rated at 271-horsepower Ford had developed for the consumer Mustang. This race version became known as the GT350. The name has nothing to do with the performance of the car, but rather Shelby's shop. When Shelby and Remington were debating on what to name the car, Shelby asked him how far the race shop was from the production shop, and he replied its around 350 feet.<sup>460</sup> This was good enough for Shelby. He stated, "If it is a good car, the name won't matter, and if it is a bad car, the name won't save it."<sup>461</sup>

Shelby and his team of hot rodders applied their own philosophy to the Mustang and removed a lot of the unnecessary weight. They replaced the steel hood with a fiberglass design, which shaved several pounds from the car and relocated the battery and spare tire in order to even out the weight distribution of the car. They also tuned the sway bar and limited the travel of

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<sup>459</sup> R&T Staff, "Words of Wisdom From Carroll Shelby," R&T, last modified May 14, 2014, accessed on January 22, 2017, <http://www.roadandtrack.com/car-culture/interviews/a18116/words-of-wisdom-from-carroll-shelby/>.

<sup>460</sup> Comer, *The Complete Book of Shelby Automobiles*, 106; and John Craft, *Mustang Race Cars* (St. Paul: MBI Publishing Company, 2002), 24.

<sup>461</sup> Comer, *The complete Book of Shelby Automobiles*, 106.

the rear axle to keep the car planted on the road. Ford loved the design and performance of the car, and proudly displayed in a June 1965 advertisement.<sup>462</sup> Its ad specifically touted the Mustang's racing ability by stating, "The most complex blind apex closing radius bend becomes the expert driver's challenge instead of an exercise in frustration."<sup>463</sup> This ad uses racing terminology such as apex, which all drivers understand as the fastest way around a corner. Ford was saying the Mustang would enable a driver to hit the apex of a turn and be the fastest car on a course. This was a competitive muscle car and for \$4547; the everyday American could afford to own a proper racecar.<sup>464</sup>

Ford and Shelby produced 562 GT350s in 1965, but Shelby continued to develop the car and build faster versions. The race version was known as the R model, which was a hyper performance version over the standard GT350. Shelby's and his team's experience producing the Cobra allowed him to quickly produce a performance Mustang. For the R version, he placed the same motor that was in the Cobra 289 into the Mustang. This proved to be an effective decision as the car won ten out of the 14 B class races and finished first overall at the National Championship.<sup>465</sup> The success of the GT350 brought a new market to Shelby American and even brought the Hertz Rental Car Company to his showroom. Beginning in 1965, Hertz offered customers the chance to rent a GT350, the company renamed the cars GT350H, and each car was painted black with gold strips in order to further distinguish the Mustang from anything else on the road. Shelby and Hertz found the cars too race focused as *The Washington Post* noted the brakes failed to pass the safety tests for consumers. The vehicle's brakes were not set up for

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<sup>462</sup> Ibid., 106-107; and Craft, *Mustang Race Cars*, 23.

<sup>463</sup> Comer, *The Complete Book of Shelby Automobiles*, 108.

<sup>464</sup> Ibid.

<sup>465</sup> Laban, *AC Cobra: The Complete Story*, 135-140; and Colin Comer, *Shelby Mustang Fifty Years* (Minneapolis, MN: Motorbooks, 2014), 116.

sudden stops, as most races do not experience abrupt stops. Racing brakes can absorb a lot of heat, but are not intended for use on city streets where a driver might need to come to a complete stop instantly.<sup>466</sup> However, this was a special project because for only \$17 a day just about anyone could experience the physical integration of hot rod culture and Detroit Industry by renting a GT350H from Hertz.<sup>467</sup>

Shelby continued to develop new cars for Ford and produced performance versions such as the GT500 and GT500 KR, which stood for King of the Road. However, even though the cars were getting more horsepower, the bodies of the car seemed to be getting bigger and bigger. This went against the philosophy of hot rod culture, as the idea is to conserve weight to allow the car to travel faster. Furthermore, government regulation was once again stepping in the way of automotive performance. Between 1967 and 1968, Shelby decided to end the production of the Cobra as government regulations were making it impossible to build the car, which he originally envisioned. He explained the difficulty of keeping up with by safety standards by stating, “Meeting them requires too much engineering.”<sup>468</sup> This would be the beginning of the end for Shelby and his relationship with Ford.

By 1968, the Shelby American Company was beginning to break apart. For example, Shelby’s racing shop moved to Torrance, California, but the portion that built parts for Mustangs moved to Ionia, Michigan to be closer to the Ford headquarters. As Ford took greater control over the racing program, Shelby began to take steps back, and by 1970, according to Randy

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<sup>466</sup> “Hertz Cars Pass Tests With Modified Braking”, *The Washington Post, Times Herald*, March 30, 1966, A3.

<sup>467</sup> Laban, *AC Cobra: The Complete Story*, 135-140; and Comer, *Shelby Mustang Fifty Years*, 116.

<sup>468</sup> Mills, *Carroll Shelby: The Authorized Biography*, 469; and Comer, *Shelby Mustang Fifty Years*, 122-123.

Leffingwell, he was nowhere to be found.<sup>469</sup> Trends within the automotive industry were shifting away from performance and consumers were looking for comfortable cars and not the one with the biggest engine. Once the Environmental Protection Agency (EPA) was established in 1970, it quickly tried to limit car emissions, and in 1970, Congress passed the Clean Air Act, which created the National Ambient Air Quality Standards. This regulated how much pollution industries and cars could emit into the environment.<sup>470</sup>

Under the act, the government required automakers to reduce the amount of smog emitted by their cars by ninety percent and increase fuel efficiency by 1975. New cars could only emit .41 grams of hydrocarbons per mile and 3.4 grams of carbon monoxide per mile.<sup>471</sup> The EPA's administrator, William Ruckelshaus, required that U.S. auto manufacturers demonstrate that they were taking steps to meet these standards.<sup>472</sup> Ford was beginning to shift the focus away from performance because buyers were no longer spending their money on new Mustangs. Mustang yearly sales would peak in 1966, with 607,000 cars sold, but by 1972, sales only hit 125,093.<sup>473</sup> The high performance models such as the GT500 were not bringing in the customers and dealers could not even sell all of their 1969 models. In effort to boost sales, Shelby American refitted them to 1970 specs in the hopes buyers would open their wallets. Shelby was quick enough to realize the impending demise of Ford's race program and began to pull his brand away from

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<sup>469</sup> Comer, *Shelby Mustang Fifty Years*, 165.

<sup>470</sup> U.S. Department of Energy, "Summary of the Clear Air Act (1970)," accessed on May 5, 2016, <https://www.epa.gov/laws-regulations/summary-clean-air-act>.

<sup>471</sup> U.S. Department of Energy, "Milestones in Mobile Source Air Pollution Control and Regulations," accessed on May 5, 2016, <https://www3.epa.gov/otaq/consumer/milestones.htm>.

<sup>472</sup> U.S. Department of Energy, "Hearings Set on Automobile Pollution Control March 4, 1971," accessed on May 5, 2016, <https://www.epa.gov/aboutepa/hearings-set-automobile-pollution-control>.

<sup>473</sup> Kirk Seaman, "Warning: Graphic Content! 50 Years of Camaro vs. Mustang Sales Numbers in Living Color," *Car and Driver* (May 20, 2015), accessed on May 5, 2016, <http://blog.caranddriver.com/warning-graphic-content-50-years-of-camaro-vs-mustang-sales-numbers-in-living-color/>.

Ford. Towards the end of 1970, Shelby reached an agreement with Ford's Vice President John Naughton that the Shelby Mustang project would cease. As a result, Shelby began shutting down and one by one his enterprise shrunk and by May 1971, Shelby Racing closed its doors.

While Ford and Shelby parted ways, Shelby stated in an interview, he had a "beautiful relationship with Ford in the early years...and he would have never been able to do what he did if it hadn't been for Ford."<sup>474</sup> The problem was the market was changing and Ford looked to back away from racing and focus on fuel efficient cars, which did not fit within hot rod culture. Shelby could mend the broken relationship between the Detroit industry and hot rod culture.<sup>475</sup>

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<sup>474</sup> WheelsTV, "Carroll Shelby: An Interview with the Snake."

<sup>475</sup> Mills, *Carroll Shelby: The Authorized Biography*, 486-487; and Christian Seabaugh, "Timeline: Carroll Shelby's Life, 1923-2012," *Motor Trend*, May 11, 2012, accessed February 12, 2017, <http://www.motortrend.com/news/carroll-shelby-life-1923-2012-timeline/>.

## Conclusion

The 1950s and 1960s were a unique time in automotive culture, as there were few government regulations mandating emissions or even safety standards. This is far different from today when the U.S. Department of Transportation has page after page of requirements for automotive manufacturers right down to windshield wipers and washing systems.<sup>476</sup> While cars today are safer and cleaner than any time before, this progress has diminished the connection between driver and machine. While society should celebrate the progress towards greater safety, there still should be an effort to recognize early automotive culture. The reason was this relationship between the driver and car will only continue to diminish as driving assistance and computers take greater control of the driving experience.<sup>477</sup> Modern cars have computers that monitor just about every aspect of driving, with some even being equipped with adaptive cruise control. This system senses the vehicle in front and either keeps pace or brakes as needed to maintain a safe distance. Companies such as Tesla and Google wish to remove the driver completely from the equation by programming a computer to take control. Tesla's most advanced autopilot system is equipped with eight cameras, radar, and even night vision. Drivers are still required to interact with the car, but that will soon be automated as well.<sup>478</sup>

These advances will usher in a new era where people can be shuttled to anywhere with little effort on their behalf, and the days of adolescents studying for their driving test will be left

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<sup>476</sup> National Highway Traffic Safety Administration, "Federal Motor Vehicle Safety Standards and Regulations", *U.S. Department of Transportation*, accessed April 5, 2017, <https://icsw.nhtsa.gov/cars/rules/import/FMVSS/#SN104>.

<sup>477</sup> "Yearly Snapshot: 2015", *Insurance Institute for Highway Safety Highway Loss Data Institute*, accessed on April 5, 2017, <http://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/overview-of-fatality-facts>.

<sup>478</sup> Full Self-Driving Hardware on All Cars", *Tesla*, accessed on April 5, 2017, <https://www.tesla.com/autopilot>.

to history.<sup>479</sup> These driving assisted devices stand in stark contrast to cars from the middle of the twentieth century, as most cars during this era were not even equipped with ABS, traction control, or even stability control. It was up to the driver to master the vehicle and by doing so, it became an extension of himself. For a driver to successfully win a race, it meant they had achieved this harmony between man and machine. This is not to detract from racing today but does further highlight the skill of previous drivers and builders such as Shelby.

Shelby's career as a racecar driver in the 1950s demonstrates a unique time in America where just about anyone could participate in the automotive sport. However, there were some limitations to racing at the professional level as the Sports Car Club of America prohibited drivers from receiving compensation, but amateurs like Shelby could prove their skills by driving at lower levels.<sup>480</sup> Shelby consistently proved himself and found team owners to sponsor him throughout his career such as Roy Cherryhomes and John Wyer. He came into contact with these sponsors by working his way through the ranks when he started racing in January 1952 at the age of twenty-nine.<sup>481</sup>

Car culture surrounded good portions of the top drivers in motorsports from an early age. For example, Dale Earnhardt Jr. is a third generation driver and began racing stock cars in 1990 at the age of sixteen.<sup>482</sup> There are examples of young drivers all across motorsports including Indy with Josef Newgarden beginning his fifth year as a professional driver at the age twenty-

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<sup>479</sup> Ibid.

<sup>480</sup> Wyss, *Shelby: The Man. The Cars. The Legend*, 8.

<sup>481</sup> Christian Seabaugh, "Timeline: Carroll Shelby's Life, 1923-2012," *Motor Trend*, May 11, 2012, accessed February 12, 2017, <http://www.motortrend.com/news/carroll-shelby-life-1923-2012-timeline/>.

<sup>482</sup> "Dale Earnhardt Jr. Biography", *Encyclopedia of World Biography*, accessed on April 5, 2017, <http://www.notablebiographies.com/newsmakers2/2004-Di-Ko/Earnhardt-Dale-Jr.html>; and "Learn More About Dale Jr.", *Official Website of NASCAR driver Dale Earnhardt Jr.*, accessed on April 5, 2017, <http://www.dalejr.com/about/biography/default.aspx>.



five.<sup>483</sup> Furthermore, a driver's peak performance today is considered to be between the ages of twenty-five and thirty-five, and while Shelby's age fits in the middle, the important factor to remember is he was a chicken farmer and dump truck driver before he ever set foot on a course.<sup>484</sup> For Shelby to not only attempt a racing career but to win against the world's best drivers at Le Mans in 1959 is worthy of scholarly examination, but the fact he went on to build his own winning car only continues to separate him from his contemporaries.

Due to a heart condition, Shelby ended his racing career as a driver in 1960, but instead of leaving motorsports completely he pursued his dream of building a true American sports car.<sup>485</sup> The development of the Cobra demonstrates Shelby's ability to interact with not only hot rod culture but also Detroit industry. Prior to Shelby designing the Cobra, there was a dividing line between the two industries and Shelby was one of the first to bridge this gap. He did this by using the resources and industrial might of the Ford Motor Company for parts and the ingenuity of Southern California hot rodders such as Phil Remington and Ken Miles to put it all together.

As a result, the Cobra went on to dominate the racing scene in the United States, but the Cobra's true potential was not seen until it outpaced Ferrari to win the FIA World GT Championship in 1965. This was the first and only time an American team accomplished this goal, and for Shelby to do it within five years of building his Cobra only further emphasizes his achievement.<sup>486</sup> Furthermore, what sets the Cobra apart from other hot rods is the fact it was sold as a homologated car. The Cobra was not a one off production like the Scarab and anyone with

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<sup>483</sup> Jeff Olson, "Young Drivers Face Rough Road to Top of Indy Car", *USA Today Sports*, last updated May 20, 2016, accessed on April 5, 2017, <http://sports.usatoday.com/2016/05/20/indycar-young-drivers-face-rough-road-newgarden-daly/>.

<sup>484</sup> Mills, *Carroll Shelby*, 29; and Wyss, *Shelby: The Man. The Cars. The Legend*, 8.

<sup>485</sup> Shelby, *The Cobra Story*, 178.

<sup>486</sup> "History," *Bondurant Racing School*, accessed March 21, 2017, <https://bondurant.com/history/>.

an extra \$5,995 could go down to their local Ford dealership and pick one out.<sup>487</sup> The reasonable availability of the Cobra is a significant contribution of Detroit industry, as Ford could easily produce the necessary parts for the Cobra and this mass production helped to keep the cost down for consumers. While the Cobra is the best example of the relationship between Detroit industry and hot rodding culture, Shelby's involvement within the Ford GT program only strengthened this connection.

During the 1960s, Ford Motor Company entered the racing world as Henry Ford II wanted to win Le Mans. Instead of designing and developing its own car, Ford decided to try and buy its way to the finish line by purchasing Ferrari. However, Enzo Ferrari saw the bureaucracy that comes along with Detroit industry and pulled out of the deal.<sup>488</sup> Ford then turned to Eric Bradley and his small car company Lola in 1964. Their project car became known as the GT40, but initial tests were subpar and failed to secure a first place finish. Ford's initial failure to buy a winning car demonstrates the delicate balance between hot rodding and industry, as too much of one generally snuffs out the benefits of the other. Ford spent millions developing the GT40 program without Shelby's help.<sup>489</sup>

In order to save a failing program, Ford turned to Shelby in the hopes he could apply his knowledge to the GT40.<sup>490</sup> Shelby worked to integrate the GT40 into the relationship he created

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<sup>487</sup> "September 1962 Road & Track Issue Featuring an AC Cobra," *Car Build Index: Car Builds, Projects, Restorations, Barn Finds and Other Cool Car Related Stories*, May 7, 2014, accessed February 12, 2017, <http://www.carbuildindex.com/27337/september-1962-road-track-issue-featuring-an-ac-cobra/>.

<sup>488</sup> Leo Levine, *Ford: The Dust and The Glory a Racing History* (New York: Macmillan Company, 1968), 484-485.

<sup>489</sup> Mate Petrany, "How This Extremely Rare Lola Helped the Ford GT40 Win Le Mans," *Road & Track*, February 6, 2017, accessed March 21, 2017, <http://www.roadandtrack.com/car-culture/classic-cars/videos/a32524/lola-mk6-ford-gt-gt40-le-mans/>.

<sup>490</sup> Colin Comer, *The Complete Book of Shelby Automobiles Cobra, Mustangs, and Super Snakes* (Minneapolis, MN: Motorbooks, 2009), 193; Levine, *Ford: The Dust and The Glory A Racing History*, 488; and

between Detroit industry and hot rod culture for his Cobra. The Ford GT went through several iterations MK II and MKIV, and through Shelby and his team of hot rodders, Ford was able to achieve victory at Le Mans in 1966 and 1967. Shelby left the program in 1967, but the foundation his company created helped Ford secure victory at Le Mans in 1968 and 1969.<sup>491</sup> While Shelby walked away from Ford's Le Mans program, this did not completely sever the bridge between hot rodding and Detroit industry, as the Mustang became the new basis to apply his formula.

Shelby had little influence on the initial design and development of the Ford Mustang in 1964. While the Mustang was wildly successful, Ford looked to Shelby to transform the Mustang into a muscle car. At first, Shelby did not think it was possible for the Mustang to race since he felt it weighed too much. Ford did not like to hear no from anyone and encouraged Shelby to go to work.<sup>492</sup> As a result, the Shelby GT350 was born, one of the most iconic cars of the 1960s, but true to his art, Shelby could not leave it alone.

By the late 1960s Shelby American was building some of the most powerful cars ever produced by Ford, the GT350H and the GT500. Shelby applied much of the same formula to these Mustangs as he did the Cobra. He started by reducing the weight and increasing the power. One of the primary differences between the performance Mustangs and the Cobra is the availability for consumers. The Mustangs opened the performance market to more Americans

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Preston Lerner and Dave Friedman, *Ford GT: How Ford Silenced the Critics, Humbled Ferrari, and Conquered Le Mans* (Minneapolis, MN: Motorbooks, 2015), 21.

<sup>491</sup> Alex Gabbard, *Ford Total Performance: The Road to World Racing Domination* (New York: HP Books, 2000), 69-70; and Ed Forster, "A Look Back at the 1966 Le Mans 24 Hours," *Motorsport Magazine*, May 5, 2016, accessed on March 2, 2017, <http://www.motorsportmagazine.com/opinion/le-mans/look-back-1966-le-mans-24-hours>.

<sup>492</sup> Randy Leffingwell, *Mustang* (New York: Crestline, 2010), 73; and R&T Staff, "Words of Wisdom From Carroll Shelby," R&T, last modified May 14, 2014, accessed on January 22, 2017, <http://www.roadandtrack.com/car-culture/interviews/a18116/words-of-wisdom-from-carroll-shelby/>.

and on the surface were a little easier to live with than an open roof roadster.<sup>493</sup> Even today, with all the advances in performance technology, automotive enthusiasts look to the 1960s as the pinnacle of muscle car development. This was an era where Detroit industry and hot rodders had reached a harmony in part through Shelby.

When Shelby passed away on May 10, 2012, America lost an enormous piece of its automotive culture. Shelby was committed to his craft and his work garners new admirers even today. Even those who overlook automotive culture, when they encounter one of Shelby's creations they might not know what exactly it is, but understand it is something special. Although Shelby is gone, his legacy in part lives on in the continued production of Cobras, GT350; and GT500s. While these new iterations are equipped with far more options than the originals, they are intended to recapture a day when Shelby brought Detroit industry and hot rod culture together.

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<sup>493</sup> Laban, *AC Cobra: The Complete Story*, 135-140; and Colin Comer, *Shelby Mustang Fifty Years* (Minneapolis, MN: Motorbooks, 2014), 116.

## Bibliography

### Primary Sources

- “All the 1966 Models GM Ford Chrysler Road Tests and Tech Specs.” *Car and Driver*, November, 1965.
- “25 Questions with Carroll Shelby- Candid Conversation with America’s #1 Automotive Legend.” *Motor trend* 49, no. 12 (1997): 94.
- Behr, Edward. “A First First For Aston.” *Sports Illustrated*, June 29, 1959.
- Bryant, Thos L. “On the Road- Carroll Shelby at 85: Candid Conversations About Past, Present and Future Shelby Automobiles.” *Road and Track* (July 2008): 11.
- Carroll Shelby: An American Legend. 2015. “1961-1964 The Cobra Years: The Sports Car Built By Southern California Hot-rodders that dominated Ferrari.” Accessed November 13, 2016. <http://www.carrollshelby.com/#/1961-1964>.
- Cartwright, Gary. “The Great Chili Championship Fix.” *Sports Illustrated*, December 11, 1967.
- Chapin, Kim. “Does Anybody Here Believe Jack Brabham?” *Sports Illustrated*, October 10, 1966.
- Comer, Colin. “One Trick Pony.” *Vintage Motorsport*, March/April, 2012.
- Ford, Henry. *Henry Ford My Life and Work*. Luxembourg: CreateSpace Independent Publishing Platform, 2013.
- Hyman, Mervin. “Denim Driver.” *Sports Illustrated*, September 28, 1959.
- Jares, Joe. “Wising Up To a Down Game.” *Sports Illustrated*, March 17, 1965.
- LaFontaine, Barbara. “At Sebring: Victory and Death.” *Sports Illustrated*, April 4, 1966.
- Laguerre, Andre. “Sand, Sea and Speed.” *Sports Illustrated*, December 3, 1956.
- Lovesey, John. “It Was Murder Italian Style.” *Sports Illustrated*, June 28, 1965.
- Moses, Sam. “Rufus, A Dinosaur Who Adapted.” *Sports Illustrated*, May 17, 1976.
- Olsen, Jack. “The Big Itch They Call Little John.” *Sports Illustrated*, January 11, 1965.
- Ottum, Bob. “Let There Be Steam.” *Sports Illustrated*, February 3, 1969.
- \_\_\_\_\_. “Scourge of Hangover Alley.” *Sports Illustrated*, December 14, 1964.

- \_\_\_\_\_. "Someone Up There Said 'Let's Race,' And Lo Ford Came Flying." *Sports Illustrated*, December 25, 1967.
- \_\_\_\_\_. "Turbines and Trauma At Indy." *Sports Illustrated*, May 20, 1968.
- \_\_\_\_\_. "World Challenge From An Eagle's Nest." *Sports Illustrated*, April 11, 1966.
- Phinizy, Coles. "Flat Out In a Wee Grand Prix." *Sports Illustrated*, May 5, 1975.
- \_\_\_\_\_. "Snakes, Butter Beans and Mister Cobra." *Sports Illustrated*, May 17, 1965.
- Road & Track Magazine. "Road & Track Magazine Records, Circa 1947-2012." Accessed November 13, 2016. <https://searchworks.stanford.edu/view/10103243>.
- Ross, Robert. 2012. "Exclusive Conversation: Remembering Carroll Shelby." Robb Report, June 14. Accessed November 13, 2016.  
file:///Users/ryanvohringer/Downloads/untitled%20folder%205/Ryan's%20Thesis/Exclusive%20Conversation:%20Remembering%20Carroll%20Shelby%20%7C%20Automobiles.webarchive.
- Rudeen, Kenneth. "A Happy Man Stood on His Head to Welcome a Winning Ferrari, While Owner-Drivers Cheered a Victorious Red Italian Duet." *Sports Illustrated*, September 17, 1956.
- \_\_\_\_\_. "Daytona's Speed Carnival." *Sports Illustrated*, February 25, 1957.
- \_\_\_\_\_. "Detroit's Secret Weapon." *Sports Illustrated*, March 25, 1957.
- \_\_\_\_\_. "Double Bananza For Sports Cars." *Sports Illustrated*, October 29, 1962.
- \_\_\_\_\_. "Long Day's Journey Into The Florida Night." *Sports Illustrated*, March 24, 1958.
- \_\_\_\_\_. "Nassau Lightning." *Sports Illustrated*, December 17, 1956.
- \_\_\_\_\_. "Texan Tornado." *Sports Illustrated*, July 16, 1956.
- \_\_\_\_\_. "The Lavendar Mob." *Sports Illustrated*, July 29, 1957.
- \_\_\_\_\_. "The Gentle Leadfoot." *Sports Illustrated*, March 25, 1957.
- \_\_\_\_\_. "They're Rolling at Riverside." *Sports Illustrated*, November 18, 1957.
- Shelby, Carroll. *The Cobra Story*. Minneapolis, MN: Motorbooks, 1965.

Shoen, Michael L. "The Cobra-Ferrari Wars." Accessed November 13, 2016.  
<http://www.cobraferrariwars.com>.

Smith, Sam. "The Unlikely Story of the Ferrari-Beating Shelby Daytona Coupe." *Road & Track*, August 14, 2015. Accessed November 13, 2016.  
<file:///Users/ryanvohringer/Downloads/SI/The%20Incredible%20Story%20of%20the%20Shelby%20Daytona%20Coupe.webarchive>.

Terrell, Roy. "Race Driving Taught Here." *Sports Illustrated*, July 9, 1962.

Underwood, John. "Big Fight Moves to Small Town." *Sports Illustrated*, May 17, 1965.

"Walt Hansgen." *Sports Illustrated*, January 20, 1958.

Whall, Hugh. "A Sweet Wet Win for America at Sebring." *Sports Illustrated*, April 5, 1965.  
\_\_\_\_\_. "It Was Snakebite Day At Sebring." *Sports Illustrated*, March 30, 1964.

Wright, Alfred. "Vanderbilt Is The Name." *Sports Illustrated*, July 4, 1960.

#### Secondary Sources

Arbon, Lee. *They Also Flew: The Enlisted Pilot Legacy 1912-1942*. Washington: Smithsonian Institution Press, 1992.

Baime, A.J. *Go Like Hell: Ford, Ferrari, and Their Battle For Speed and Glory at Le Mans*. New York: Houghton Mifflin Harcourt, 2009.

Baird, Nicola. *The Estate We're In: Who's Driving Car Culture?* London: Indigo, 1998.

Berger, Michael L. *The Automobile in American History and Culture: A Reference Guide*. Santa Barbara: Greenwood, 2001.

\_\_\_\_\_. *The Devil Wagon in God's Country: The Automobile and Social Change in Rural America, 1893-1929*. Hamden, CT: Archon Books, 1979.

Blanke, David. *Hell on Wheels: The Promise and Peril of America's Car Culture, 1900-1940*. Lawrence, KS: University Press of Kansas, 2007.

Braun, Eric. *Hot Rods*. Minneapolis: Lerner Publications Company, 2007.

Callaway, Sue Zesiger. "Business Life- The Mustang Rides Again- At 84 Auto Legend Carroll Shelby Delivers a Road-Ripping Muscle Car for Ford." *Fortune* 156, no. 2 (2007): 198.

\_\_\_\_\_. "Life at the Top- Muscle Car Mania- Racing Legend Carroll Shelby Unleashes His Latest and Greatest: The Super Snake." *Fortune* (October 12, 2009): 43.

- Carroll, William. *When the Hot Rods Ran*. San Marcos, CA: Auto Book Press, 1991.
- Comer, Colin. *The Complete Book of Shelby Automobiles: Cobras, Mustangs, and Super Snakes*. Minneapolis, MN: Motorbooks, 2014.
- \_\_\_\_\_. *Shelby Cobra: The Snake That Conquered the World*. Minneapolis, MN: Motorbooks, 2015.
- \_\_\_\_\_. *Shelby Mustang Fifty Years*. Minneapolis, MN: Motorbooks, 2014.
- Craft John. *Mustang Race Cars*. St. Paul: MBI Publishing Company, 2002.
- Craven, W.F. and J.L. Cate, ed. *The Army Air Forces in World War II Men and Planes*. Washington, D.C.: Office of Air Force History, 1983.
- Dauphinais, Dean D, and Peter M. Gareffa. *Car Crazy: The Official Motor City High-octane, Turbocharged, Chrome-plated, Back Road Book of Car Culture*. Detroit: Visible Ink Press, 1996.
- Davidson, Eric. *Snake Bit: Carroll Shelby's Controversial Series 1 Sports Car*. Minneapolis, MN: Motorbooks, 2004.
- Davis, David E. "Four Days with a Shelby GT500, 50 Years with Carroll Shelby." *Car and Driver* 24 (January 2010): 22.
- Dickensheets, S. "What I've Learned Carroll Shelby, Carmaker." *Esquire* 144, no. 3 (2005): 230.
- Dobrin, Michael; Philip E. Linhares and Pat Ganahl. *Hot Rods and Customs: The Men and Machines of California's Car Culture*. Oakland, CA: Oakland Museum of California, 1996.
- Embry, Jessie. "The Last Amateur Sport: Automobile Racing on the Bonneville Salt Flats." *Americana: The Journal of American Popular Culture, 1900 to Present* 2: no. 2 (Fall 2003): 1.
- Evans, Art. *Carroll Shelby: A Collection of My Favorite Racing Photos*. Forest Lake, MN: CarTech, 2016.
- \_\_\_\_\_. *Shelby, the Race Driver: With Remembrances By Carroll Shelby*. Skokie, IL: Photo Data Research, 2008.
- Farber, David. *Sloan Rules: Alfred P. Sloan and the Triumph of General Motors*. Chicago: The University of Chicago Press, 2002.
- Friedman, Dave, and John Christy. *Carroll Shelby's Racing Cobra*. Minneapolis, MN:



- Motorbooks, 1990.
- \_\_\_\_\_. *Cobra: The Shelby American Original Archives 1962-1965*. Minneapolis, MN: Motorbooks, 2002.
- \_\_\_\_\_. *Remembering the Shelby Years- 1962-1969*. Los Angeles: The Carroll Shelby Children's Foundation, 1998.
- Gabbard, Alex. *Ford Total Performance: The Road to World Racing Domination*. New York: HP Books, 2000.
- Girdler, Allan. *American Road Race Specials 1934-1970*. Osceola, WI: Motorbooks International Publishers, 1990.
- Giucci, Guillermo. *The Cultural Life of the Automobile: Roads to Modernity*. Austin: University of Texas Press, 2012.
- Glaeser, Edward. *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*. New York: The Penguin Press, 2011.
- Heitmann, John. *The Automobile and American Life*. Jefferson, NC: McFarland & Company, Inc., Publishers, 2009.
- Henny, Phil. *...Just Call Me Carroll...!* Hudson, WI: Editions Cotty, 2004.
- Hill, Frank Ernest. *The Automobile: How It Came, Grew, and Has Changed Our Lives*. New York: Dodd, Mead, & Company, 1967.
- Hill, Phil. "Salon: 1959 Aston Martin DBR1- America's First Formula 1 Champion Recounts the Against-the-odds Le Mans Victory of the DBR 1 Driven By Carroll Shelby and Roy Salvador at the Expense of His Own Ferrari." *Road and Track* 50, no. 10 (1999): 140.
- Hoag, Kevin, and Brian Dondlinger, *Vehicular Engine Design*. New York: Springer, 2015.
- Ingrassia, Paul. *Engines of Change: A History of the American Dream in Fifteen Cars*. New York: Simon & Schuster, 2012.
- Laban, Brian. *AC Cobra: The Complete Story*. Ramsbury, Marlborough: The Crowood Press, 2006.
- \_\_\_\_\_. *Shelby and the AC Cobra*. UK: Crowood, 2015.
- Lacey, Robert. *Ford: The Men and the Machine*. Boston: Little, Brown and Company, 1986.
- Ladd, Brian. *Autophobia: Love and Hate in the Automotive Age*. Chicago: University of Chicago

- Press, 2008.
- Leffingwell, Randy. *Mustang*. New York: Crestline, 2010.
- \_\_\_\_\_. *Shelby Mustang: Racer for the Street*. Minneapolis, MN: Motorbooks, 2005.
- Legate, Trevor. *Cobra: The First 40 Years*. Minneapolis, MN: Motorbooks, 2006.
- Lerner, Preston and Dave Friedman. *Ford GT: How Ford Silenced the Critics, Humbled Ferrari, and Conquered Le Mans*. Minneapolis, MN: Motorbooks, 2015.
- Levine, Leo. *Ford: The Dust and The Glory A Racing History*. New York: Macmillan Company, 1968.
- Levine, Robert. "King of the Road- As Carroll Shelby, 83, Applies the Winning Formula Behind His Classic 1960s Mustang to Ford's New 2007 Shelby GT500, Robert Levine Gauges the Legacy of a True Texas Original." *Vanity Fair* (July 2006): 114.
- Lewis, David Lanier and Laurence Goldstein. *The Automobile and American Culture*. Ann Arbor: University of Michigan Press, 1983.
- Linde, Arvids. *Electric Cars- The Future is Now!: Your Guide to the Cars You Can Buy Now and What the Future Holds*. Dorchester, UK: Veloce Publishing, 2010.
- Lucsko, David N. *The Business of Speed: The Hot Rod Industry in America, 1915-1990*. Baltimore: The Johns Hopkins University Press, 2008.
- Lynch, Michael T., William Edgar, and Ron Parravano. *American Sports Car Racing in the 1950s*. Osceola, WI: MBI Publishing Company, 1998.
- Maxton, Graeme P., and John Wormald. *Time For a Model Change: Re-engineering the Global Automotive Industry*. Cambridge: Cambridge University Press, 2004.
- Miller, Daniel. *Car Cultures*. Oxford, Berg, 2001.
- Mills, Rinsey. *AC Cobra: The Truth Behind the Anglo-American Legend*. UK: Haynes Publishing, 2002.
- \_\_\_\_\_. *Carroll Shelby: The Authorized Biography*. Minneapolis, MN: Motorbooks, 2012.
- \_\_\_\_\_. *Essential AC Cobra: The Cars and Their Story 1962-67* (Bideford, UK: Bay View Books, 1997).
- Misiroglu, Gina, ed., *American Countercultures: An Encyclopedia of Nonconformists, Alternative Lifestyles, and Radical Ideas in U.S. History*. England: Routledge, 2008.

- Moorhouse, H.F. *Driving Ambitions: An Analysis of the American Hot Rod Enthusiasm*. New York: Manchester University Press, 1991.
- Morton, John. *Inside Shelby American: Wrenching and Racing with Carroll Shelby in the 1960s*. Minneapolis, MN: Motorbooks, 2013.
- Motor Trend. *Shelby: A Tribute to An American Original*. Minneapolis, MN: Motorbooks, 2012.
- Mugenyi, Bianca, and Yves Engler. *Stop Signs: Cars and Capitalism on the Road to Economic, Social, and Ecological Decay*. Vancouver, British Columbia: Transcontinental Printing, 2011.
- Nader, Ralph. *Unsafe At Any Speed: The Designed-In Dangers of the American Automobile*. New York: Grossman Publishers, 1965.
- Noeth, Louise Ann. *Bonneville Salt Flats*. Osceola, WI: MBI Publishing Company, 1999.
- Norman, Donald A. *Turn Signals Are the Facial Expressions of Automobiles*. New York: Addison-Wesley Publishing Company, Inc., 1992.
- Parissien, Steven. *The Life of the Automobile: The Complete History of the Motor Car*. New York: Thomas Dunne Books, St. Martin's Press, 2014.
- Parks, Wally. *The Fast Lane: The History of NHRA Drag Racing*. New York: Regan Books, 2001.
- Passon, Jerry W. *The Corvette in Literature and Culture: Symbolic Dimensions of America's Sports Car*. Jefferson, N.C. McFarland, 2011.
- Rubin, Louis D. *The American South: Portrait of a Culture*. Baton Rouge: Louisiana State University Press, 1980.
- Setright, L.J.K. *The Designers: Great Automobiles and the Men Who Made Them*. Chicago: Follett Publishing Company, 1976.
- Smith, Carroll. *Tune To Win: The Art and Science of Race Car Development and Tuning*. Fallbrook, CA: Aero Publishers, Inc., 1978.
- Smith, Steven Cole. "Snake Oil Never Sleeps- Carroll Shelby's Gnarly Automotive Legend Gets Even Crustier." *Car and Driver* (March 2008): 34.
- Spurring, Quentin. *Le Mans: The Official History of the World's Greatest Motor Race 1923-29*. New York: Evro Publishing Limited, 2016.
- \_\_\_\_\_. *Le Mans: The Official History of the World's Greatest Motor Race 1945-59*. New York: Evro Publishing Limited, 2011.

- \_\_\_\_\_. *Le Mans: The Official History of the World's Greatest Motor Race 1960-69*. Sparkford, UK: Haynes Publishing, 2010.
- Stone, William Sidney. *A Guide to American Sports Car Racing*. New York: Doubleday, 1971.
- Streather, Adrian. *Ford GT: Then, and Now*. Dorchester, UK: Veloce Publishing Ltd, 2015.
- Thompson, Neal. *Driving With the Devil: Southern Moonshine, Detroit Wheels, and the Birth of NASCAR*. New York: Three Rivers Press, 2006.
- Thoms, David; Len Holden, and Tim Claydon. *The Motor Car and Popular Culture in the 20<sup>th</sup> Century*. Brookfield: Ashgate, 1998.
- Tolbert, Frank X. *A Bowl of Red*. New York: Doubleday & Company, Inc., 1972.
- Vincent, Peter. *Hot Rod Garages*. Minneapolis, MN: Motorbooks, 2013.
- Volti, Rudi. *Cars & Culture: The Life Story of a Technology*. Baltimore: The Johns Hopkins University Press, 2004.
- Wik, Reynold M. *Henry Ford and Grass-roots America: A Fascinating Account of the Model-T Era*. Ann Arbor: The University of Michigan Press, 1973.
- Williams, Richard. *Enzo Ferrari: A Life*. London: Yellow Jersey Press, 2002.
- Witzel, Karl Michael and Kent Bash. *Cruisin': Car Culture in America*. Osceola, WI: Motorbooks International Publishers & Wholesalers, 1997.
- Witzenburg, Gary L. "Carroll Shelby." *Automobile Quarterly* 44 (2004): 48-59.
- \_\_\_\_\_. *Mustang! The Complete History of America's Pioneer Ponycar* (Princeton, NJ: Princeton Publishing Inc., 1979).
- Wollen, Peter and Joe Kerr. *Autopia: Cars and Culture*. London: Reaktion Books, 2002.
- Wyss, Wallace A. *Shelby: The Man. The Cars. The Legend*. Hudson, WI: Iconografix, 2007.