

# Pinewood Derby Drop-Ins

## Derby History

- The first Cub Scouts to participate in a pinewood derby were from Cub Scout Pack 280c of Manhattan Beach, Calif. The event was originated by Cubmaster, Donald Murphy, and was run in the Manhattan Beach Clubhouse on May 15, 1953.
- Don Murphy was inspired to create the Pinewood Derby by an older and very well known event, the Soap Box Derby. A local Chevrolet dealer sponsored the Soap Box Derby, but the minimum age to enter was 12... too young for a Cub Scout. As a result Don invented the Pinewood Derby as a separate event for the younger boys including his 10-year old son Don Jr.
- An article covering that first Pinewood Derby appeared in the Cub Scout Quarterly's summer issue in 1954. The October 1954 issue of Boy's Life was the first time the Derby was mentioned and included plans to make the car. Plans for the track and starting and finishing line mechanisms could be purchased from Boy's Life for 15 cents. I am fortunate enough to own a copy of that Boys Life issue as well as an autographed copy of Don Murphy's Book: Pinewood! The Story of the Pinewood Derby.
- The June 1955 *Program Helps* listed "Wheels, Wings, and Things" as a theme. The *Cub Scout Program Quarterly* gave instructions for running the Pack Meeting Derby. The Supply Division's catalogs had kits available for \$2.75 for a package of eight. Over 15 million kits were sold during the next 20 years.
- Since its start in 1953, an estimated 50 million fathers (mostly) and sons have participated in races. Millions more-parents, den leaders, Cubmasters, committee members-have been involved in various ways. It's estimated over 100 million car kits have been sold.
- Derbies of one kind or another have always been a part of Cub Scouting. As early as 1939, the BSA Supply Division listed kits for model planes, boats, and airplanes. The derbies have been viewed as a way to get parents and sons to cooperate on a project.
- The rules for that very first race in 1953 look surprisingly similar to rules used today. The notable exception: In that first race no lubricant or graphite was to be used on the wheels or axels. "What's amazing to me," said Murphy, "After all these years, the plans and rules are basically the same."
- The grand-prize winner of the very first Pinewood Derby was Den Chief, Richard Hoffman. Interviewed for a book on the history of the Derby, he said he did a lot of the work with help from his father. He also mentioned that scouting was very big in those days. The "whole town" showed up for the race and "it was a lot of fun."
- The original track design was two lanes with a declining four-foot ramp. The electrical finish line was built with two doorbell coils, powered by four, 1 ½ volt batteries. Light bulbs would identify the winners.

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- Not quite one year after the first Pinewood Derby in 1953, news had spread and a Manhattan Beach citywide Derby was held. Soon after, word of the Derby reached the National Directors of the Boy Scouts of America and they decided to promote the event throughout the entire country.
- An early *Cub Leader's Round Table* contained instructions for holding a Kite Derby. Competitions included the 100 yard dash, novelty kites, altitude race, artistic kites, kite battle, and the messenger race. The BSA Supply Service offered a pamphlet entitled *Kites* to teach kite making.
- In April of 1937, Scouters were given the directions for making the Cubmobile. The original intention for the Cubmobiles was that they be any contrivance on wheels. According to the How Book of Cubbing, "It may be drawn, pushed, or propelled by Cubs, or may be drawn by a trained animal-in fact, anything goes!" Most ended up patterned after the Soapbox Derby racers.
- Sailboat Regatta kits arrived in 1958 with kits for eight boats selling for \$2.95. The rubber band driven Space Derby kits followed the start of the space race in 1961. Another derby was made available during the seventies, the Rocket Derby. The kits were later dropped from the Supply Division catalog.
- One car from the original 1953 Pinewood Derby still exists. Cub Scout Tommy Gaian did most of the work himself on the car. It was painted gold with red trim and had a carefully painted number 41 on the side. Together with his father, Tommy added intake stacks to the top and an exhaust pipe down the left side.
- The hunt for details of the origin of the Pinewood Derby began in 1997 when a Scoutmaster of Pack 713 discovered that the original number for his Pack was 280C until it split into two packs during a population boom in Manhattan Beach, Ca. He looked up old records and found the original Scoutmaster; Don Murphy lived only a few miles away. Murphy not only kept all of the records from that Derby, he also held the copyright from the Library of Congress.
- The Scout house used for the first Pinewood Derby is still in use today. A plaque was mounted on the outside of the house to commemorate the building as the site of the first Pinewood Derby.
- In 2003, fifty years after the first Pinewood Derby, Don Murphy, now a vigorous 83 years old, was the guest of honor at several 50th anniversary pinewood derby events in California. One of the most spectacular of these took place in March at the Blackhawk Museum in Danville, near San Francisco. The annual "Blackhawk 500" pinewood derby, which the museum has hosted since 2000 for Cub Scouts from the Mount Diablo Silverado Council, was turned into an extravagant celebration of the derby's golden anniversary.

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## Old Guys History

- A Bunch of Old Guys & a Track is just about what it says. Most of us are former Cub Scout leaders who helped build a 1st class Pinewood Derby track in the fall of 1977 for Pack 514, Coon Rapids. With some help from family and friends of the pack and some limited corporate sponsors, the track was used for the first time in February and April 1998.
- In 1999 the track was used for 4 derby events, including the first rental, Pack 297, Roseville Lutheran.
- The A Bunch of Old Guys & a Track group was formed in January of 2001. We purchased the track from Pack 514 and the guys formed a not-for-profit organization to benefit Scouting. During that first year of operation the Old Guys ran 8 races. Since then we have averaged 14 derbies a year.
- All time is donated and all proceeds from running the derby are used to improve the track and the race package. In an effort to keep improving the Derby experience, we have invested close to thirty thousand dollars to bring you the derby you are watching today.

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## Derby Miscellaneous

- The track is second to none. It made of milled, cast aluminum with an anodized Teflon coating and is 48 feet long. We use an electronic finish line and computerized race results. Race times are accurate to .0001 of a second.
- A .0001 second difference in race times on today's track means a difference of approximately 1/100 of an inch at the finish line. That would be a tough call to do visually. Our finish line uses infrared sensors, which trigger when the front edge of the car blocks the overhead light source.
- Because the track is modular by design, we can run it at 36, 48, or 60 feet. Although we have run a shorter track, we have never used the full 60 feet. There would be few facilities able to accommodate that length and many Pinewood Derby cars would not be able to make it to the finish line.
- The software program we are using is called Grand Prix Race Manager. It was custom written for Pinewood derbies and similar events. It can also be used to race sailboats, semi-trucks, or rockets. We work directly with the programmer to report software bugs as well as suggested enhancements.
- The track is elevated to improve viewing for spectators. Racing banners in use came from real racing events and were purchased on EBay. The bunting is made from 18 racing flags.
- The race schedule is determined using a mathematical formula called "The Perfect-N Generator." The priorities in this formula are: (1.) Each car races in each lane the same number of times and (2.) Each car races each opponent the same number of times.
- While there are lots of specifications for Pinewood Derby cars there are very few specifications for the tracks they run on. Don Murphy's original track in 1953 was 32 feet long. Ours today is 48 feet. From starting gate to finish line is 45 feet 10 inches.
- According to Old Guys statistics we find Webelos Cub scouts are Pack racing champions more often than other ranks. It's the experience! In a close second place are Bears, followed by Wolves and finally Tigers.
- At the beginning of each round of racing a (2) copies of the complete race schedule are printed and given to the Old Guys at the top of the track. One schedule is used to stage the cars for the next race and put them in lane order on the car carrier. Once on the top of the track, the second schedule is used to verify the correct cars are in the correct lane and ready to race.
- The car carriers we use to hand off the cars and carry them back to the top of the track were designed to safely transport the cars. In fact, they were designed the week after we dropped a car handing off to an Old Guy at the top of the track!

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- The background of the Old Guys has proven to be valuable in helping set up the race you see today. Work experience of the Old Guys includes: machinist, carpenter, I/T manager, electronics engineer, truck driver, banker, and computer hardware and software support specialists. Tim raced cars for a number of years and Chuck has experience as a radio announcer. Most of the Old Guys are former Cub Scout and Boy Scout leaders.
- The finish gate is called “The Judge” by New Dimensions. It is custom built to fit our track and costs about \$535. We have the one we use and a spare in the event of a hardware failure.
- If you haven’t seen it, ask your son or grandson to show you his driver’s license for today’s race. Each Scout was issued a custom driver’s license including the pack name and number, the scout’s name and car number.
- All of the cars are built from standard Pinewood Derby kits. Although they are built and painted in a variety of ways, they must all be 5 oz. or less and have the proper clearance to run on the track. Your pack may also have additional restrictions.
- Five ounces, the maximum pinewood derby car weight, is equal to about 56 1/2 new (post 1982) copper-clad US pennies. The older bronze penny (95% copper/5% tin & zinc) is heavier and requires about 46 to equal 5 ounces.
- Few if any, of the winning cars at the San Diego 500 (one of the larger Pinewood Derbies) have had characters attached or wore excessive trim.
- The best design for a fast car on one track may not be the best for another track due to slope, run-out, lane guide type etc. We have also noticed that good wheel lubrication and maximum mass allows a car to pass another on the flat run-out portion of the track.
- Some organizations have major competitions for design, unique concepts and appearance and may not race cars at all.
- Some organizations have sponsored Corporate Pinewood Derbies. In these derbies businesses build and race cars for trophies. They pay an entry fee and proceeds go to the sponsoring organization.
- A Pinewood Derby by any other name is still a Pinewood Derby. Our scouting brothers in Canada run a derby they call a ***Kub Kar Rally*** in the UK it’s the ***Kotick Cubs Pinewood Derby***, and the YMCA calls their race an ***Adventure Guides Pinewood Derby***. Several other church youth organizations also run derbies. Some examples include: the Southern Baptists ***Royal Ambassadors Race Derby***, the Assemblies of God ***Royal Rangers Pinewood Derby***, Awana ***Grand Prix***, the Christian Service Brigade ***Shape N Race Derby*** the ***Lutheran Pioneers Pinewood Derby***.
- What do you think of this, guys? Even the girl scouts are getting in on the fun. Several Girl Scout troops and Girl Indian Guides troops now run Pinewood Derbies. Again this year, the Old Guys will run a Derby for the Girl Scouts.

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- In a less than honorable moment in Derby history, on a night in January 2004 during practice runs Friday evening prior to the competition at a school in Kansas, one of the racers crashed. As a result of the accident, a vial of liquid mercury placed inside the car broke apart, splashing the toxic material on the floor, putting as many as 70 Cub Scouts and their parents at risk and prompting a lengthy cleanup. An over-zealous parent had used the illegal substance in a car. The race had to be cancelled plus it took four hours and \$5000 for a hazardous materials handling team to clean up the mess.
- For those of you who can't get enough Derby racing, you can now build and race cars in the Woodcar Independent Racing League. They “promote individually sponsored woodcar racing events similar to Pinewood Derby.” Their monthly proxy races are called the Builders Cup Series. Build your car, send it to them with the entry fee and they will race it against other cars from around the nation. Points are kept similar to other racing sports. For more information search the Internet for WIRL or the Woodcar Independent Racing League.
- Another form of scale model drag racing is done with slot cars. You may be old enough to remember to remember the 1/25 scale, electric motor-powered cars. The tracks are 55 feet (1/4 mile scale) and come complete with electronic timing systems and “Christmas tree” starting lights. Cars run \$35 on up...sometimes way up! For more information check out [www.slotside.com](http://www.slotside.com) on the Web.
- A company in Los Angeles now offers a new option for birthday parties – Matchbox car drag racing. For \$225 they will bring out a vinyl track that looks like a Pinewood track, but races Hot Wheels or Matchbox cars instead. The company is called Race Grooves. Check them out on the Web at [www.racegrooves.com](http://www.racegrooves.com).
- In the late 1990s, *Car and Driver* magazine decided to have their four staff engineers build a Pinewood Derby car and race it against cars built by Penske Cars Ltd. of IndyCar fame, Darrell Waltrip's Winston Cup team, and Elliott Forbes-Robinson's 600 Racing. To make sure they were kept honest they used Pinewood Derby rules, were monitored by Scoutmasters and also raced against four Cub Scouts from Atlanta. The result: the car cost \$2318.00 including engineering labor and lost to the Cub Scouts.
- Here's an idea for a fun family movie. *Down and Derby* is a fun and entertaining comedy about a small-town Pinewood Derby competition that transforms an average group of dads into an awkward bunch of competitors. In the crazed world of derby fever, the kids are lucky if they get to pick the paint color or attach a decal. The DVD is available at Wal-Mart.
- In an interview with *Down & Derby* Exec. Producer, Film Director, and Writer Eric Hendershot, he admits that the movie came out of his own experience. In his own words Eric noted, "When I took my oldest son Steele to his first Pinewood Derby. I saw the dads with their clenched fists and iron jaws. It was quite an experience. I came home and said to Dickilyn – there's a movie here and sure enough (there was)."

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- There are plenty of sites on the Internet offering advice on building a faster Derby car. Some sites give you information; others want you to pay for it. Try a Google search on Pinewood Derby.
- There is a cross between Pinewood Derby and the Soapbox derby on steroids called Extreme Gravity Racing. Referred to as XGR, it was founded by Don MacAllister, of Irvine California. XGR began with MacAllister's vision to offer corporations a world-class team-building activity, racing unique gravity-powered cars, while providing employment opportunities for foster youth. Teams now range from privateers to car manufacturers. The formula has grown in vehicle specifications, speed, competitors, length and difficulty of courses--and correspondingly, media interest--every year. For more details see: [www.gravityseries.com](http://www.gravityseries.com).
- Pinewood Derbies are common at US overseas military bases as soldiers try to give their children a taste of what's going on back home, however here is a first: A co-ed International Scouting group formed this summer in Hasar, Iraq held its first-ever Pinewood derby Oct. 6, 2005 thanks to leaders' efforts and cars donated by families of 116th Brigade Combat Team Soldiers. This local scouting group, is known as Kashafa in Iraq. "The scout leaders with help from the Soldiers, built a track and helped the youth build their cars and hold their first competition," said Capt. Matthew Godfrey, a Task Force 1/148 Field Artillery operations officer. Enabling Iraqi children to laugh and have fun and instill some friendly competition was a key goal to the formation of the scouting organization," Godfrey said.
- Back in March of 1998, senior engineering students from Washington University in St. Louis, MO, joined in the fun at an edible Pinewood Derby. One of the Engineering Week events at the School of Engineering and Applied Science was a race with a twist – all the cars needed to be made from edible items. Sarah Davenport's celery-chassis creation won the contest in both speed and distance.
- Classify these ideas under the categories of cool, unusual, odd, outlandish and unbelievable but they've been done, suggested or at least stories we've been told. Who knows?
  - There are universities using Pinewood Derby cars and tracks to demonstrate the many elements of Physics involved in this gravity-powered race.
  - We've heard that there's a 12 lane Pinewood Derby track out there somewhere.
  - The turtle race. The slowest car to actually cross the finish line is the winner.
  - Then there's the story of a track that has a 360 degree loop in both of its two lanes. (Cool).
- Here's a twist on capitalism: In 2005 EBay had a Pinewood Derby car that was complete except for the final decalging. The weight system had been established but is not shown on the car as not to tip off the competition. The owner was offering to sell spots on this car to display your business or name.

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- A missionary couple, Tol and Linda Butler have even taken the idea of a Pinewood Derby to an orphanage in Moscow Russia. The Moscow Training Center had it's first annual Pinewood Derby Race in April of 2003. Fifty-three cars were ready for weigh in and judging. Winning designs included a Coke Bottle car and a Violin car. Other entries were a pizza slice, Oscar Meyer weiner-mobile, a hand painted Russian spoon, a killer whale, a 100 dollar bill, a coffin, and automobiles, buses and trucks of every description.
- The BSA National Scouting Museum hosted more than 1,500 visitors during its opening ceremony and during its first week of operation after reopening in October 2002 in a new 50,000-square-foot facility next to the BSA national office in Irving, Texas. One of visitors' favorite exhibits was the Pinewood Derby track, where Cub Scouts can participate in actual races.
- In January of 2006 the following question was asked on the "Ask Metafilter" website. "Since the wheels and axels of all competing cars must be the same (as required by the Derby rules), how could a 5oz derby car go faster along the same track then a 2.5 oz car? What would Galileo say?" The question got several pages of responses from physics-nuts and ranged from the absurd tip, "Put a small matter-transfer device on the car, to remove air from in front and insert it behind the car," to the abstract, "The force calculation you're interested in is  $F_n = F_g - F_d$ , where  $F_n$  is the net force on the car,  $F_g$  is the force on the car from gravity, and  $F_d$  is the force on the car from air drag."
- In December 1999, seniors at Cornell University in MAE 427, Experimental Methods in Fluids and Heat Transfer, were given the option to turn in a slightly shorter technical report (their sixth in the course) if they participated in a truck race modeled after the "Pinewood Derby". In this pass/fail creative design competition, students were required to follow specially modified design rules that put an emphasis on aerodynamics as well as friction and other factors. One hundred students took the challenge to produce the senior big rigs. Notables included the Oscar Meyer, a transport vehicle for a big sausage; the Daedalus Venture, a beautifully designed aerodynamic teardrop truck carrying a banana that was carefully nibbled for precise weight control; and Latinos In Black whose design team sported jet black suits and sunglasses to match their truck.
- John Shreffler is the fellow who makes our electronic finish line called 'The Judge'. He got started in his adventure many years ago when his son was in Cub Scouts, and as fate would have it, he got 'volunteered' out of the audience to be a human judge. The next year, he came to the derby with a crude homebuilt optical finish line and it was an immediate hit. Against his wife's cautions, he made an investment in parts, and the rest of the story is history.
- According to the Pinewood Derby Champ Internet site, Official BSA Pinewood Derby wheels come from one of 16 different molds. The author claims almost all wheels made prior to 2006 from mold number 13 and mold 9 have a defect which causes the wheel to wobble. The mold number is stamped on the inside of the wheel. The problem appears to be resolved for 2006.
- For the Pack on a budget, a company makes a 32-foot, four-lane, heavy-duty cardboard track, supported by a colorful cardboard tower. It transports it in its handy cardboard storage carton with handles. It includes a starting gate, finish line and braking section. The cost? \$75.00.

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- The Industrial Designers Society of America (IDSA) held a very open, almost unlimited class derby in October 2004 at their national conference held in Pasadena, California. The event was sponsored by NIKE. There were no weight restrictions, no height, and no materials restrictions. Carbon fiber was "in!" One company spent \$8,000.00 in billable hours and materials for one entry!
- For the last couple of years, Lowes and Dremel have sponsored a Pinewood derby design contest. They offer a free car carrying box while supplies last and the grand prize is a trip for two to Lowes Motor Speedway in Charlotte. NC. Check out their website at <http://www.derbydesigncontest.com/>.
- An Internet search on "Pinewood Derby" will bring up thousands of hits. Among other items I discovered a garage band named "Pinewood Derby".
- Derbies can be sponsored by a number of organizations including 4H. County fairs, racetracks, malls, automobile dealerships and museums have all been sites for derbies.
- University organizations have sponsored Pinewood Derby competitions, some as service events, and others as competitions for students. In 2006 The American Society of Mechanical Engineers will hold their 2nd annual Pinewood Derby during Engineers Week at Carnegie Melon University.
- In 2005 Rod Ryan, the morning show host on Houston's the BUZZ 94.5, sponsored the First Annual Morning Wood Derby for adults. Rod's a former Cub Scout, and he remembers the best thing about scouting was the annual Pinewood Derby Races. The downside was being 10 years old and not trusted with a saw by his old man. Consequently, Rod never lent so much as a finger in making his cars. The event raised enough money to buy a new track for a local Cub Scout pack and will be repeated in the fall of 2006.
- In the 1997 catalog season BSA supply introduced eighteen wheel truck kits. Unfortunately they were removed by the BSA supply division in 2001. While they were fun to build they were harder to race and in many cases the tracks just couldn't handle them. The Old Guys track was built with these trucks in mind and they run just fine on our track.

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## Racing Trivia

- The Pinewood Derby most closely resembles National Hot Rod Association (NHRA) drag racing. The most recognizable of all dragsters are the top fuel dragsters. These 25-foot landlocked missiles are capable of covering the quarter-mile in less than 4.6 seconds at speeds of 325 mph.
- The nitro-methane-powered engines of NHRA Top Fuel dragsters and Funny Cars produce more than 6,000 horsepower, about 40 times that of the average street car.
- Top Fuel dragsters and Funny Cars also consume between four to five gallons of fuel during a quarter-mile run, which is equal to between 16 and 20 gallons per mile. By the way, that fuel costs about \$30 per gallon.
- Pro Stock dragsters look like their showroom counterparts, but looks can be deceiving. These 1994 or later two-door coupes and sedans (domestic or foreign), are carbureted, gas-burning machines with extensive modifications and can reach speeds of 200 mph in the quarter-mile.
- A Top Fuel dragster leaves the starting line with a force nearly five times that of gravity, the same force of the space shuttle when it leaves the launching pad at Cape Canaveral.
- NHRA Top Fuel dragsters and Funny Cars use 10 to 12 gallons of fuel for a burnout, back-up to the starting line and quarter-mile run. Their fuel pumps deliver 65 gallons of fuel per minute, equal to eight bathroom showers running at the same time.
- It's desirable for an NHRA Top Fuel dragster to race with its front wheels inches off the ground for about the first 200 feet of the run. This ensures proper weight transfer to the rear wheels, a crucial part of a good launch and quick run. Also, the 17-inch rear tires used on NHRA Top Fuel dragsters and Funny Cars wear out after four to six runs, or about two miles.
- The average attendance at an NHRA Winston Drag Racing Series event in 1998 was more than 100,000, higher than the average of any NFL, Major League Baseball, NBA or NHL team.
- NHRA also sponsors Jr. Drag Racing. Jr. Dragsters are half-scale dragsters powered by five horsepower Briggs & Stratton engines that produce speeds up to 85 mph. Anyone can join the Junior Drag Racing League (JDRL), but kids must be ages 8-17 to compete as drivers. A basic Jr. Dragster costs about \$3,000. The helmet, clothing and other equipment are additional and about 25 percent of JDRL members are female.
- Three-time Formula One Champion Michael Schumacher is one of many drivers who make it a ritual to get into their cars the same way each time. Along with his brother, Ralf, the left side of the car is the "lucky" side. Michael even goes so far as to make certain it is his right foot that he puts into the car first.

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- Nine-time NHRA Funny Car Champion John Force has become one of the richest men in drag racing yet you'd never know it to see him walking around the track. His driver's suit looks like it's been mauled through a mud pile by a pride of hungry lions. It has. Force has been in crashes, fires, and explosions and survived unscathed through all of them. It's his "lucky" suit and he's not about to wear anything else.
- A once strong superstition in the racing world was that green was an "unlucky" color. A favorite track story in almost every racing series is how one driver was so incensed by the sight of this unlucky color that he threw one well-wisher out of his pits for daring to wear a green shirt. That superstition lasted until the team owner said he had good news and bad news. "What's the good news?" the driver demanded. "We have a new sponsor!" the owner enthused. "How is that bad news?" the delighted driver questioned. "His company color is green." The owner responded with trepidation. The driver thought for a moment. "Green just became my favorite color." Today, green is seen on almost as many racecars as any other color...whenever green is the sponsor's color.
- Why are "funny cars" called funny cars? The answer is that in the first year or two of their existence, funny cars actually DID look funny! Racers did all sorts of experimentation to try to get better traction. This made for a very comical appearance. After about three years, funny cars didn't look funny at all. Since the late sixties, lots of people think they've been the coolest looking drag cars out there. There have been attempts to change the name. In the 1980's, there was a movement by one of the top racing magazines to change the name to "Fuel Coupe." This way the 'FC' part would be the same, but the class name would be closer to reality. It never caught on, though.
- At the highest levels of the sport, drag racing is EXTREMELY expensive. The cost to put together a competitive racing car is from \$100,000 to \$200,000. Since these racing teams must basically rebuild their engines from four to eight times a weekend, the cost in spare parts is staggering. Now add \$50,000 to \$200,000 for a transporter and trailer, add the salaries of the driver, the crew chief, and all the associate crew members and the cost of hotels, meals, gasoline, and all the other costs associated with traveling to 22 major races all over the country during the racing season! To compete for the world championship, you have to spend at LEAST one million U.S. dollars!