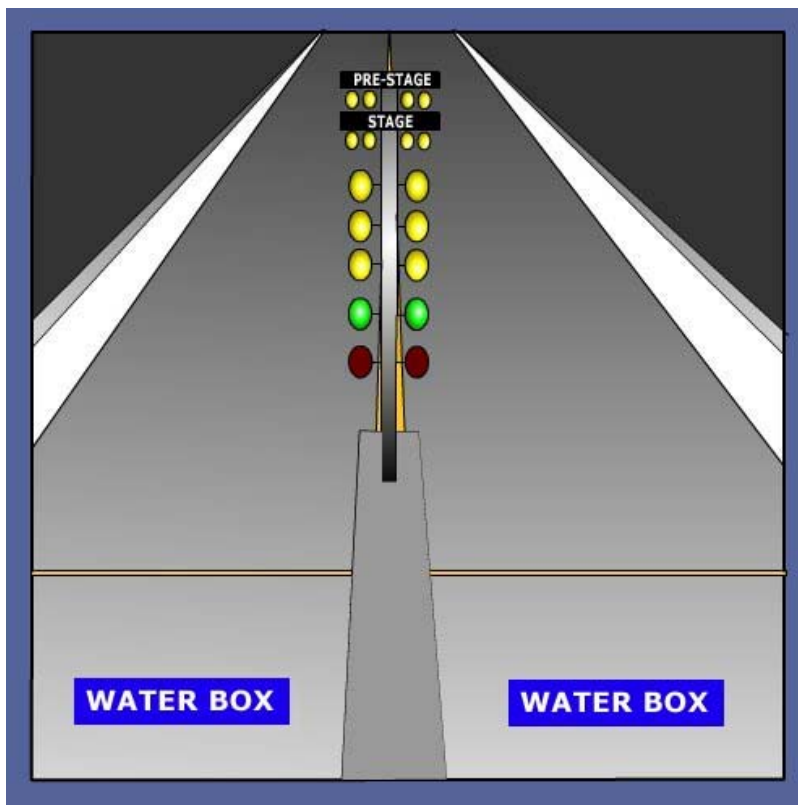


# Drag Racing 101

## The Basics...

A drag race is an acceleration contest from a standing start between two vehicles over a measured distance. The accepted standard for that distance is either a quarter-mile (1,320 feet) or an eighth-mile (660 feet). A drag racing event is a series of such two-vehicle, tournament-style eliminations. The losing driver in each race is eliminated, and the winning drivers progress until one driver remains.

These contests are started by means of an electronic device commonly called a **Christmas Tree**, because of its multicolored starting lights. On each side of the Tree are seven lights: two small amber lights at the top of the fixture, followed in descending order by three larger amber bulbs, a green bulb, and a red bulb. More on the Tree later, but here's basically what it looks like:



## Preparation...

Obviously, make sure your car is in good mechanical condition before participating in any competitive event. Double check your fluid levels, particularly engine oil and coolant. Make sure all belts and hoses are in good condition, as are the tires.

Insure you have about  $\frac{1}{2}$  tank of fuel when you reach the racetrack. Too much fuel and you are carrying excess weight. Too little fuel and you run the risk of starving the fuel pump during hard acceleration.

Before heading to the racetrack, empty the car of any non-essential items. No need to carry any excess weight and more importantly, you don't want any loose objects flying around inside the car.

What to bring with you:

- Pen (to fill out your tech/entry card)
- Proper clothes for the day's weather. Cooler at night. NHRA rules say no shorts or tank tops. Wear long pants and fully enclosed shoes.
- Sunscreen and Bug Repellant as necessary
- Helmet (required by NHRA rules if your car runs 13.99 or quicker)
- Tire Pressure Gauge (and portable air compressor, if you have one)
- Money (\$15 to race + extra for snack bar goodies)
- Fold up chairs
- Ice chest w/water (glass or booze is a no-no)
- Windex and towels to clean windshield
- Emergency tools
- Zaino or Quick Detailer (you may be slow but you can still look good!)

### **Upon Arrival...**

When you arrive at the track, pay your admission fee at the gate for both racers and spectators. Then proceed to the Tech Station where you will be given a short info form to fill out and liability waiver to sign.

On the driver's side window or back coupe glass, they will use white shoe polish to write your car number for the event. Don't sweat it... the shoe polish comes right off with a bit of Windex after the race.

Proceed to your "pit area" which is just anyplace near the track where you can gather with friends and drop off your fold up chairs, ice chest, or anything else not needed in the car for racing. This is the time to make last minute checks of the car including fluid levels and tire pressures. Watch out for pedestrians.

Lower the pressure in your rear tires by 5-10 pounds. If you have an air pump, increase the pressure in the front tires by about the same amount. Don't lower or increase pressure so much as to make it hazardous. You can readjust tire pressure after racing at a gas station on the way home.

### **Time to Stage...**

"Street Drags" events means no bracket racing or classes... just run what ya brung against the clock for your best time.

When you are ready, proceed to the staging lanes. They generally have 2 to 5 staging lanes set up. Just line up behind everyone else and stay with your car so you can pull forward as races progress. Don't idle your engine unnecessarily in the staging lanes. You want the engine to stay as cool as possible between races. You might opt to open your hood to let it cool off more while you wait. Some folks go so far as to place a bag of ice on the intake manifold. Yeh, you *can* go to extremes, but keep it fun.

It is generally a random choice who you run against depending on how the cars line up. You can attempt to pair up with a buddy to race with but don't hold up the line. Everyone else wants to race, too.

Depending on how busy they are, you may only have time for 3 runs or so down the track. Delays are inevitable (oil spills, broken cars, junk on the track, etc) so be patient and enjoy the moment. Now is a great time to visit with all the other drivers, check out their cars, and get your last minute tips from the "experts". You'll find no shortage of those. ☺ Watch a couple cars to see how they enter onto the track, warm up their tires, stage, and launch to get more comfortable with the process.

### **Time to Race...**

When you are next up to race, a track official will pair you up with another car, either to your left or right. Put your helmet on, snug up your seat belt and roll UP your windows (NHRA rules). Make sure your A/C is off and turn off your traction control (ASR). Leaving ASR on is a sure way to kill your time on the track.

If you are the right hand car, you will be racing the inside lane (closest to the spectator stand). If you are the left lane, you will be racing the outside lane. Don't worry about which lane for your first run.

Watch the track official. When he motions you on, pull up and to the right onto the race track.

If you are running on street tires, drive around the waterbox in your lane and center your car in the middle of your lane. After bypassing the waterbox and before approaching the Christmas tree, you may do a short, very controlled burnout to clean off and warm up the tires a bit. For street tires, this really isn't very important, but it helps remove any small rocks or water in the treads you may have accidentally picked up. Besides, its fun, too. ☺ Just be careful and keep control of your vehicle.

After your burnout, slowly approach the Christmas tree being certain to stay in the center of your lane. The track official near the tree will warn you if you are off center. Two light beams cross the starting-line area and connect to trackside photocells, which are wired to the Christmas Tree and electronic timers in the control tower. When your front tires break the first light beam, called the **PRESTAGE** beam, the pre-stage lights on the Christmas Tree indicate that you are approximately seven inches from the starting line.

When you roll forward into the **STAGE** beam, the front tires are positioned exactly on the starting line and the stage bulbs are lit on the Tree, which indicates that the vehicle is ready to race. Do not let your car roll forward or backward from this point. If you do, the stage lights will go out and you'll have to move the car until the lights come back on again. When both vehicles are fully staged, the starter will activate the Tree, and each driver will focus on the three large amber lights on his or her side of the Tree.

Once you are staged, WATCH THE CHRISTMAS TREE AND BE READY TO GO! They don't waste any time here. Once both cars are staged, just a couple seconds later the lights will begin to flash down and the race is on. Don't be caught napping!

### **The Launch...**

When the Christmas tree lights start, the top amber lights will flash, then the second, then the third, then the green lights will illuminate, each one only ½ second apart. You should launch the car the moment you see the 3<sup>rd</sup> yellow light come on. Due to the delay from the time your eye sees the 3<sup>rd</sup> yellow light and your brain tells your right foot to GO, the car likely won't move forward until just after the green light comes on. If you wait until you actually see the green light, your "reaction time" (**RT**) will be slow and your elapsed time will suffer. Yes, this takes practice to perfect (believe me, I'm still working on it myself!). ☺

Your RT is usually expressed as a number indicating how long you leave after the last amber light comes on. A perfect time would be .500, which is exactly when the green light comes on. If you get under .500, you "**Red Light**" and lose the race. If you take longer than .500, you will take longer to get to the finish line, which can lose the race for you. Your RT will be recorded on your time slip.

If you have an automatic transmission, quickly but smoothly push the accelerator pedal to launch. Just mashing the gas can make you lose traction, not to mention the race. With the light green, you want to be shooting down the track, not sitting at the starting line with your tires going up in smoke. It may look cool, but that won't win you any races!

If you have a manual transmission, quickly but smoothly push the accelerator pedal while releasing the clutch to launch. Dumping the clutch at high rpm will just cause your tires to go up in smoke while your opponent races down the track. Dropping the clutch at too low RPM will cause your engine to bog, again wasting valuable time. So until you really get the hang of it, concentrate on smoothness and you'll do well.

If you feel things get out of hand (massive wheelspin or whatever), just back off for that run! There'll be others. Also, if it's your very first time down the track, you might not want to give it 100% the first time. The track is a lot slicker than most roads, so be aware and be careful.

Two separate performance indicators are monitored for each run: **elapsed time** and **trap speed**. Upon leaving the staging beams, each vehicle activates an elapsed-time clock, which is stopped when that vehicle reaches the finish line. The start-to-finish clocking is the vehicle's elapsed time (**ET**), which serves to measure performance or how "quick" your car is, or more correctly, how quick YOU are in that car.

**Trap Speed** is measured in a 60-foot "speed trap" that ends at the finish line. Each lane is timed independently. Stay in your lane at all costs. Keep the pedal on the floor until well past the finish line! Letting off the gas before crossing this distance will obviously kill your trap speed. Trap Speed is largely independent of driver skill so is a better indication of the amount of horsepower your car generates.

Normally, the first vehicle across the finish line wins the race. But for street drags events (under what is known as "**Sportsman**" rules), you are really just racing against the clock. A racer may be disqualified for leaving the starting line too soon, leaving the lane boundary (either by crossing the centerline, touching the guardwall or guardrail (ouch!), or striking a track fixture such as the photocells). Not a good idea. ☺

**Past the Finish Line...**

Once you have crossed the finish line, start slowing down while staying in your lane and watch the other car! Most tracks have at least two exit points (turn offs) on the right hand side of the track. If you are racing in the right lane, slow down quickly so you can exit using the first exit point if possible. If you are in the left lane, keep an eye on the other car and when he exits, pull into the right lane and take the second exit point. The main point is, do NOT pull in front of the other car which might cause an accident.

Once you have exited the track and are on the return road, stop at the timing shack where you will be handed your time slip. Now is not the time to read it; wait until you are safely parked back in the pit area. There are a lot of people walking around and other traffic, so go slow, be safe, and have fun!

Your time slip will show the times and speeds for both you and your opponent in the other lane that you hopefully just dusted. As you get more practice, you'll become more consistent and learn what techniques work best for you. Each car and each driver are different so experiment a bit to see what works.

**Sample Time Slip**

5:30 PM 15/APR/2004			←	Date/Time of Race
Temp F.		66		
Relative Humidity		85	←	Weather conditions
Absolute Barometer		29.62		
Dodge/Fram Atolite/Prstne				
	-----	LEFT	.....	RIGHT
Car # ...		56		84
Class ...				
DIAL ...				
R/T ...		.055		.342 ←
60ft ...		1.951		2.773 ←
330ft ...		5.511		7.087
1/8 ...		8.463		10.665 ←
MPH ...		83.72		68.15 ←
1000 ...		11.008		13.801
1/4 ...		13.177		16.510 ←
MPH ...		103.68		82.89 ←
Left 1st		2.9344		
CompuLink		AUTOSTART OFF		
Rnd # TO		394/395		
..... CompuLink StarTrak				

Most importantly... **HAVE FUN!!!**

# Glossary of Drag Racing Terms

**Breakout:** Used only in handicap racing, the term breakout refers to a contestant running quicker than he or she "dialed" his or her vehicle (predicted how quick it would run). Unless his or her opponent commits a more serious infringement (e.g., red-lights, crosses the centerline, or fails a post-race inspection), the driver who breaks out loses. If both drivers break out, the one who runs closest to his or her dial is the winner.

**Burned Piston:** When a cylinder runs lean (too much air in the air-to-fuel mixture) and excessive heat burns or melts the piston.

**Burnout:** Spinning the rear tires in water to heat and clean them prior to a run for better traction. A burnout precedes every run.

**Christmas Tree:** The Tree, as it often is called, is the noticeable electronic starting device between lanes on the starting line. It displays a calibrated-light countdown for each driver.

**Clutch Dust:** Carbon dust created when the surface of the clutch discs wear as they slide together during the clutch-lockup process.

**Clutch Lockup:** The progression of clutch-disc engagement controlled by an air-timer management system.

**Deep Staged:** A driver is deep staged when, after staging, he or she rolls a few inches farther, which causes the prestage light to go out. In that position, the driver is closer to the finish line but dangerously close to a foul start.

**Dial-Under:** Dialing under allows drivers in Super Stock and Stock, which are handicap categories, to select an elapsed time quicker than the national index. As with a dial-in, a driver selects a dial-under, or e.t., that he or she thinks the car will run based on qualifying performance. The breakout rule is in effect.

**Diaper:** A blanket made from ballistic and absorbent, often Kevlar, that surrounds the oil pan and serves as a containment device during engine explosions. Required on Top Fuel dragsters, Funny Cars, Alcohol Dragsters, and Alcohol Funny Cars.

**Displacement:** In an engine, displacement is the total volume of air-to-fuel mixture that an engine theoretically is capable of drawing into all cylinders during one operating cycle.

**Dropped Cylinder:** When a cylinder becomes too rich (too much fuel in the air-to-fuel mixture) and prevents the spark plug(s) from firing.

**Elapsed Time:** An elapsed time, or e.t., is the time it takes a vehicle to travel from the starting line to the finish line.

**Eliminations:** After qualifying, vehicles race two at a time, resulting in one winner and one loser. Winners continue to race in tournament-style competition until one remains.

**Foul Start:** A foul start is indicated by a red-light on the Christmas Tree when a car has left the starting line before receiving the green light, or starting signal.

**Fuel Injection:** A fuel-delivery system that replaces conventional carburetion. Fuel injection delivers fuel under pressure directly into the combustion chamber or indirectly through the airflow chamber.

**Full Tree:** Used in Competition, Super Stock, and Stock, for which a handicap starting system is used to equalize competition. The three amber bulbs on the Christmas Tree flash consecutively five-tenths of a second apart, followed five-tenths later by the green starting light. a perfect reaction time on a full Tree is .500.

**Guard Beam:** A light beam-to-photocell connection located 16 inches past the staged beam that is used to prevent a competitor from gaining an unfair starting-line advantage by blocking the stage beam with a low-installed object such as an oil pan or header collector pipe. If the guard beam is activated while the staged beam is still blocked, the red foul light is triggered on the Christmas Tree and the offender is automatically disqualified.

**Headers:** Fine-tuned exhaust system that routes exhaust from the engine. Replaces conventional exhaust manifolds.

**Holeshot:** Reacting quicker to the Christmas Tree starting lights to win a race against a quicker opponent.

**Index:** The expected performance for vehicles in a given class as assigned by NHRA. It allows various classes of cars in the same category to race against each other competitively.

**Interval Timers:** Part of a secondary timing system that records elapsed times, primarily for the racers' benefit, at 60, 330, 660, and 1,000 feet.

**Methanol:** Pure methyl alcohol produced by synthesis for use in Alcohol Dragsters and Alcohol Funny Cars.

**Nitromethane:** Produced specifically as a fuel for drag racing. It is the result of a chemical reaction between nitric acid and propane.

**Pre-staged:** When a driver is approximately seven inches behind the starting line and the small yellow light atop his or her side of the Christmas Tree is glowing.

**Pro Tree:** Used in Top Fuel, Funny Car, Pro Stock, Pro Stock Bike, Alcohol Dragster, Alcohol Funny Car, Super Comp, Super Gas, and Super Street, which feature heads-up competition. All three large amber lights on the Christmas Tree flash simultaneously, followed four-tenths of a second later by the green starting light. A perfect reaction time on a Pro Tree is .400.

**Reaction Time:** The time it takes a driver to react to the green starting light on the Christmas Tree, measured in thousandths of a second. The reaction-time counter begins when the last amber light flashes on the Tree and stops when the vehicle clears the stage beam.

**RPM:** Revolutions per minute, or rpm, is a measure of engine speed as determined by crankshaft spin.

**Sixty-foot Time:** The time it takes a vehicle to cover the first 60 feet of the racetrack. It is the most accurate measure of the launch from the starting line, which in most cases determines how quick the rest of the run will be.

**Slider Clutch:** A multi-disc clutch designed to slip until a predetermined rpm is reached. Decreases shock load to the drive wheels.

**Speed Trap:** The final 66 feet to the finish line, known as the speed trap, where speed is recorded.

**Staged:** A driver is staged when the front wheels of the car are right on the starting line and the small yellow light below the prestaged light on his or her side of the Christmas Tree is glowing. Once a driver is staged, the calibrated countdown (see Christmas Tree) may begin at any time.

**Supercharger:** The supercharger, or blower, is a crank-driven air-to-fuel mixture compressor. It increases atmospheric pressure in the engine, resulting in added horsepower.

**Wedge:** An engine with a wedge combustion chamber, a combustion chamber resembling a wedge in shape. Need not have parallel intake and exhaust valve stems.

**Weight Transfer:** Weight transfer is critical to traction. Vehicles are set up to provide a desired weight transfer to rear wheels. When the vehicle accelerates, the front wheels lift and the weight shifts to the rear wheels, which makes them less likely to spin.

**Wheelie Bars:** Used to prevent excessive front-wheel lift