

PDMCC

Pendle District Model Car Club

www.pdmcc.co.uk

Setup Guide

Glossary of racing terms

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A-arm: The lower arm of a suspension assembly, often times resembles the letter "A".

ABC / Non-Ringed: These letters stand for aluminum, brass and chrome or a composite such as nickel. These engines have an aluminum piston and a chrome or composite coated brass cylinder sleeve which allows them to be more efficient for higher performance. They have no piston ring and rely on a very tight piston/cylinder fit to obtain a piston/cylinder seal. New ABC engines are normally hard to turn over by hand. Because of the tight fit, it is very important that the engine is broken in properly.

Ackerman: The degree of difference in the steering angle between the inside and outside wheel when a vehicle is turning.

Adjustable Travel Volume: (ATV): ATV allows you to preset the maximum travel of a servo to either side from its neutral position. Such settings help tailor control action to suit your driving style.

Anti-Squat: The angle, from horizontal, of the inner rear hinge pin in relationship to the chassis. Anti-squat helps to keep the rear suspension from squatting (compressing) under acceleration.

Armature: Is the spinning part of an electric motor. Also known as the arm.

ARR: Some cars and trucks are available virtually pre-built and will be indicated by the terms ARR (Almost-Ready-To-Run) or RTR (Ready-To-Run). The ARR/RTR vehicles cost a little more, but if you're just not interested in building your car, this is an option for you. Most vehicles, however, come in kit form and require you to do the building. This may require a few evenings, but the familiarity you gain from assembly will make repairs, adjustments and modifications easier to make down the road.

Arcing: When voltage jumps from the brush to the commutator (or from one surface to another) due to poor or corroded contact between the two components. Arcing will cause excessive heat, resulting in premature brush and commutator wear.

Battery Eliminator Circuitry: (BEC): A circuit that eliminates the need for a receiver battery, usually in electric R/C cars and boats.

BB: These letters usually designate a ball-bearing supported crankshaft in an R/C engine. This makes the engine run smoother and last longer. Ball-bearings are also used on wheels and other rotating parts on a car or trucks chassis, allowing the vehicle to roll more freely, which in turn, allows the Nitro engine or Electric Motor to power the vehicle to its fastest speeds.

BEC: (Battery Eliminating Circuitry): Eliminates the need for a separate battery pack to power the receiver and servos. This circuitry can be found in speed controls as well as receivers.

Body Roll: The changing of the chassis' angle in relation to the ground when going through turns or corners.

Bottom End: A vehicle's acceleration rate from a dead stop, or the amount torque available from a motor depending on type of motor and gearing.

Brush: A small rectangular piece of conductive metal that makes contact with the commutator inside an electric motor.

Bump-Steer: The changing of steering angles while the suspension is moved through its range of travel. Generally, not a desired action.

CA: (Abbreviation for "Cyanoacrylate"): An instant type glue that is available in various viscosities (Thin, Medium, Thick, and Gel). These glues are ideal for gluing R/C car or truck Tires and Wheels together. Note: Most CA glues will attack Styrofoam.

Camber: The angle, from vertical, of the wheels. Negative camber is when the top of the tire is closer to the center of the vehicle than the bottom of the tire. Negative camber is commonly used to add stability in bumps. Positive camber is when the bottom of the tire is closer to the center of the vehicle than the top of the tire. Positive camber is not commonly used.

Camber Link: The rod assembly used to connect the rear hub to the rear bulkhead and the front spindle carrier to the front shock tower. These are often adjustable, but sometimes fixed.

Capacitor: A small electronic component used as a filter to reduce radio noise generated by an electric motor.

Carburetor: The part of the engine which controls the speed or throttle setting and lean/rich mixture via setting of the needle valve.

Carcass: The main "body" of a tire.

Caster: The angle, from vertical, of the kingpin in relation to the ground. Caster can have a great effect on how a vehicle enters and exits turns and corners. Increasing positive caster, so that the kingpin is angled back, will generally increase steering going into a corner and a slight decrease in steering coming out. Less positive caster will decrease the amount of steering going into a corner, but will increase the amount of steering in the middle and while exiting that corner.

Center of Gravity (C.G.): The point on the chassis at which the vehicle balances with all components installed. C.G. is the three-dimensional balance point of the car. That is, there is a vertical C.G. as well as a horizontal C.G. All forces acting on the chassis can be considered to act through the chassis' center of gravity. Ideally, a vehicle's center of gravity should be as low as possible.

Charger: Device used to recharge batteries, usually supplied with the radio if NiCd batteries are included.

Cold Solder Joint: A solder joint with poor electrical integrity. It is not mechanically, or electrically solid, and has a rough or grainy look. Cold joints can cause radio interference.

Commutator: The top part of the armature. Typically referred to as the Comm. The comm takes the current the brushes.

Compound (Tire): The type of rubber that a tire is made of. A softer compound will usually have more traction than a harder compound, while often wearing quicker.

Compression: The pressure that builds in a glow engine as the piston moves through the up-stroke.

Concourse: A contest at racing events where vehicles are judged on their appearance.

Connecting Rod: The rod that connects the piston to the crankshaft in a glow engine.

Contact Patch: The "footprint" of a tire; the part of a tire which comes in contact with

the road surface which is elliptical in shape.

Countersunk: A (flathead) screw with a tapered head; A hole with an angle that accepts a flathead screw. (countersunk chassis)

Crystals: Crystals are tuned to resonate at an exact frequency so that the transmitter (Tx) and receiver (Rx) operate on the same frequency. Crystals may be purchased separately and in many different channels.

Current Limiter: An adjustment on an ESC to limit the current that the motor can draw during acceleration. This eliminates high, inefficient current spikes and reduces wheel spin.

Dampening: The resistance caused by fluid in a shock body when the piston moves through it.

Diff (Differential): The part of the drive train which allows powered wheels (front or rear) to rotate at different speeds. This is important since, when turning, the outside wheel travels farther and faster than the inside wheel.

Diff Balls: In a ball differential , the balls float within the diff gear and cause the opposite side to rotate in the opposite direction when the diff gear is held and one outdrive is turned.

Diff Rings: The metal rings that the diff balls run against.

Discharge: The act of draining a battery of its stored energy, either by running a vehicle or connecting the battery pack to discharge device.

Dogbone: The shaft used to transfer power from a transmission outdrive to the drive axle. Because of the roll pins found at each end, the finished product resembles a dog bone.

Drag: Resistance encountered that impedes motion or movement

Dual Rate: An adjustment found on some radios which allows adjustment of the distance a servo arm will travel.

Dump: A. term used to describe when a battery's charge is running out.

Electric vs. Gas Cars: Electric vehicles are the most popular choice in R/C car racing. They are quick, quiet, easy to build and comfortable for the beginner to drive. The electric cars are powered with a rechargeable NiCad or Nickel Metal Hydride battery

that can be charged in as little as 15-20 minutes. A vehicle with a stock motor will provide about 6-8 minutes of run time; with a couple of batteries and a 15 minute charger, an electric car or truck is ready for hours of use. In 2001 an electric modified car reached 111 mph. The popularity of Gas vehicles has increased tremendously over the last few years. The explosive power and acceleration of a gas powered car or truck is exciting to watch. Gas vehicles are powered by a small two-cycle engine burning glow fuel (not gasoline!), and many modelers enjoy the realistic sound and smell that goes along with gas powered racing. Some gas models can reach speeds over 80mph....one was actually clocked with a Police Radar Gun at 102mph. The wider availability of pull-start engines and the new wave of 1/10 scale vehicles has made it much more affordable for the beginner to enter gas-powered racing.

Electronic Speed Control (ESC): Electronic speed controls replace the mechanical speed control and servo, providing enhanced power efficiency and precision in an electric R/C car, truck or boat. In addition, they are lighter which improves the performance of most electric models.

Endpoint Adjustment: This radio feature adjusts the length of servo travel in one direction (a single channel will have adjustments for two endpoints). If your car or truck can make a tighter left hand turn then it can a right hand turn, endpoint adjustments can correct the problem by allowing you to adjust the servo to travel the same distance in both directions. Endpoint Adjustment featured radios are recommended for cars and trucks with Nitro engines....it allows you to set the Carburetor and Brake settings just right.

Expanded Scale Voltmeter (ESV): Device used to read the battery voltage of the on-board battery pack or transmitter battery pack.

Flux: Actually rosin, but often referred to as "flux"; helps the flow of solder.

Foam Insert: A foam ring or donut that is used in soft compound tires for support.

Four Stroke (Four Cycle): Although a 4-stroke engine has less power than a 2-stroke engine of comparable size, there are advantages to 4-stroke engines. They do not require a muffler and are often quieter than most 2-strokes are with a muffler.

Gauge: A standard of measure used to determine the thickness of wire.

Glitch: Momentary radio problem that can cause your car or truck to go out of control. This is more common with Nitro cars and trucks. To prevent your car or truck from going out of control if your radio does glitch, put a return spring on the Servo that controls the throttle and brake. The return spring will close down the throttle and apply the brake, if the onboard receiver losses contact with the radio, because of a glitch.

Glow Plug: The heat source for igniting the fuel/air mixture in the engine. When starting the engine a battery is used to heat the filament. After the engine is running, the battery can be removed. The wire filament inside the plug is kept hot by the "explosions" in the engine's cylinder.

Glow Plug Igniter: A powered device (usually 1.2V), which connects to a glow plug. Used to ignite the filament in the glow plug in order to start the engine.

Graphite: A stiff, lightweight, space age composite material commonly used for chassis, suspension arms, shock towers, and other parts of a vehicle's chassis.

Hairpin: A sharp, 180 degree turn on a track; when viewed from above, it resembles a hair pin.

Hardware: Articles made of metal used to assemble a vehicle, e.g., screws, nuts, washers, etc.

Heat Sink: Made of a heat conductive material, a heat sink is used to dissipate heat over an increased surface area.

Hit (or to be hit): Sudden radio interference which causes your model car or truck to drive in an erratic manner. Most often caused by someone turning on a radio that is on your frequency, but can be caused by other radio sources miles away.

Holeshot: A term used to describe the initial lead at the start of a race

Hook: When the rear end of the vehicle has a tendency to kick out when turning with the throttle on. Sometimes known as over steer.

Horizontal Load: When cornering, it is the force applied to an individual tire in the direction parallel with the road surface.

"Hydra-Drive": A fluid slipper clutch, manufactured by Team Losi, that increases rear traction.

Idle Bar Plug: This type of glow plug has a "bar" across the tip to help prevent raw fuel from being splashed onto the glow element. Too much raw fuel will cool the plug and prevent it from igniting the fuel/air mixture. An idle bar is a help in obtaining a low idle speed. This type of glow plug is not often used on R/C cars or trucks.

Kick Up: The angle of the entire front suspension, from horizontal, in relationship to the rest of the chassis.

Kingpin: The pin in the steering assembly on which the steering spindles rotate.

Lean: A term used to describe the way an engine is running when it is not drawing enough fuel compared to the amount of air. This will cause the engine to run hot and if run in this condition too long, will cause engine damage.

LED (Light-Emitting Diode): Those little red lights you see on everything from speed controllers to chargers-even tail lights!

Load Up: A term used to describe a tire that is completely packed with dirt around the lugs or spikes. This usually happens on a wet tracks with loose dirt.

Longitudinal Flex: The flex of a chassis when both ends are being forced toward each other.

mAh (Milliamp Hour): A measure of a battery's total capacity. The higher the number (ex. 600 mAh, 1,500 mAh) the more charge a battery can hold and usually, the longer a battery will last under a certain load. Typical rechargeable receiver battery packs are in the 500-600 mAh range. Typical R/C car motor batteries are in the 1,400 - 3000 mAh range.

Monster Truck: Monster trucks are Big! They are the king of the hill in any group of R/C vehicles. Designed for torque instead of speed, these car crushers can move up hills, down slopes and over unsuspecting cars by virtue of sheer, brute power. The gas powered monster trucks are nearly unstoppable.

MOSFETs: Two acronyms used as one term: MOS-metal-oxide semiconductors, and FET-field-effect transistor. MOSFETs are used as switches in electronic speed controls to control the amount of current passed from the battery pack to the motor.

Muffler: A device attached to the exhaust outlet of the engine to reduce noise and increase back pressure which helps low speed performance.

Muffler Baffle: A restrictor plate inside the muffler which reduces engine noise. This plate can be removed to increase power, but only if there are no noise restrictions where you drive.

Needle Valve: Adjustment on a carburetor used to set proper fuel/air mixture. Some carburetors have separate needle adjustments for low and high throttle. Typically, turning the needle clockwise (screwing in) leans the mixture (less fuel), and vice versa. However, there are a few exceptions--refer to the engine manufacturer's instructions.

NiCad: Nickel Cadmium battery. Rechargeable batteries which are typically used as power for radio transmitters and receivers.

Nitro: Nitro-methane, a fuel additive which increases a model engine's ability to idle low and improves high speed performance. Ideal nitro content varies from engine to engine. Refer to the engine manufacturer's instructions for best results. Nitro content in fuel is indicated by the percent of the fuel.

Ni-Starter: A self-contained battery and glow plug clip, used when starting the engine.

Off-Road car: Off-road buggies and trucks are the most popular land vehicles. These cars sport full-travel suspensions, and high ground clearance. Their knobby rubber tires give them the ability to tackle any dirt terrain. These cars are available in gas or electric, 1/10, 1/12 and 1/8th scale. On a dirt track or at the park, these off-road are great fun.

Ohm: A measure of electrical resistance.

On-Resistance: The measure of electrical resistance, at full throttle, of an ESC at a given temperature. As the temperature increases, the on-resistance increases. A lower on-resistance will give you more power. A lower on-resistance also means the ESC will run cooler.

On-Road Car: On-road cars don't have the beefy suspension that the off-road cars have, but they are impressive in their authentic looks and all out speed. Built for racing on smooth, paved surfaces, they are available in gas or electric, 1/10, 1/12 and 1/8 scale. It's easy to get involved. On-road cars are burning up the tracks of organized parking lot racing courses everywhere.

Outdrives: The piece that mount on either end of the diff gear and transfer power out of the transmission.

Over geared: The condition where a gear ratio is too low for the motor. This results in excessive motor heat and causes the motor to draw more amps from the ESC

Over steer: A situation in which the front tires have more traction than the rear tires. This causes the rear tires to lose traction in comers. (Do not confuse this condition with bad throttle control on behalf of the driver.)

PCM (Pulse Code Modulation): A transmission system that uses digitally encoded signals. A PCM radio is less likely to glitch than an AM or FM radio.

Peak Charger: A peak charger automatically shuts off when your battery is fully

charged. This means longer run times for your vehicle. Peak chargers are nearly foolproof, if you forget to turn it off, the charger does it for you. No more overcharged batteries.

Pinion Gear: The gear that attaches to your motor.

Pitch: The number of teeth per inch on the gear. The higher the number, the smaller the teeth.

Planetary Gear Diff: A type of differential that has small gears rotating around the center drive gear.

Power Panel: 12-volt distribution panel that provides correct voltage for accessories like glow-plug clips, fuel pumps and electric starters. Usually mounted on a field box and connected to a 12-volt battery.

Preload: The amount of tension on a spring, via the spring collar, before a shock is compressed.

Programmable or Computer Radios: These high-tech radios are not inexpensive but allow a full set of programmable transmitter features like multiple car memory, preprogrammed commands (throttle sensitivity, braking, etc. at the touch of a button) and much more.

Punch: R/C racers' term used to describe the amount of acceleration a car or truck possesses.

Push: A term used to describe a vehicle with oversteer. (see oversteer above)

Reamer: An angled tool with a rough surface used to enlarge holes...to mount a Body to the chassis for example.

Receiver (Rx): An electronic device that receives the signal from the transmitter.

Resistance: The resistance of electricity flow through a circuit, or connection. Resistance is measured in units called ohms.

Resistor: An apparatus possessing resistance to electrical current. When attached to a Ni-Cd battery, a resistor will drain the power that is in the battery.

Resistor-Type Speed Control: Mechanical speed controls that possess a wiper arm and resistor. The resistor has different steps that act as different speeds as the wiper moves across the surface of the resistor.

Rich: A term used to describe the way an engine is running when it is drawing too much fuel compared to the amount of air.

Ride Height: The point at which the vehicle naturally rides when fully loaded with the necessary equipment.

Roll Center: A point about which the sprung mass of the vehicle will roll under influence of centrifugal force.

RPM (Revolutions Per Minute): Just that! The number of times an object completely rotates (360 degrees) in one minute.

RTR: Some cars and trucks are available virtually prebuilt and will be indicated by the terms ARR (Almost-Ready-To-Run) or RTR (Ready-To-Run). The ARR/RTR vehicles cost a little more, but if you're just not interested in building your car, this is an option for you. Most vehicles, however, come in kit form and require you to do the building. This may require a few evenings, but the familiarity you gain from assembly will make repairs, adjustments and modifications easier to make down the road.

Sand Bagger: Term used for a racer running in to low of a main or class. Either because they broke in a qualifier or because they are too chicken to run with people of their same ability level.

Schottky Diode: Helps with more consistent braking, more efficient motor operation and allow cooler operation of electronic speed control. Schottky diode is only recommended on forward only, no reverse electronic speed controls

Self Tapping: A screw that creates threads in the material it is penetrating.

Servo: A small device, used for steering (and throttle with Nitro cars), that rotates proportionately to the input from the transmitter. The servo contains a motor and an electronic controller.

Servo Horn: Attaches to the servo, and is the link between the servo and the tie-rod.

Servo Saver: Usually a servo horn that uses a spring to absorb sudden shock or impact coming from the servo linkage.

Servo Output Arm: The removable arm or wheel which bolts to the output shaft of a servo and connects to the pushrod.

Servo Reversing: This radio feature allows you to install the servos where they can

give the best pushrod routing without concern about the direction of servo rotation. When your installation is complete, turn on your radio and check each channel. If a channel operates opposite of its intended direction, a simple flick of a switch corrects the problem.

Sidewall: The side of the tire that extends from the wheel up to the top of the carcass.

Slop: Unwanted, excessive free movement in a control system. Often caused by a hole in a servo arm or control horn that is too big for the pushrod wire or clevis pin. This condition allows the control surface to move without transmitter stick movement.

Spoiler: Often referred to as a wing, a spoiler disturbs the air flowing over the body to create down force on the car.

Spur Gear: The gear that is attached to the differential or gear box.

Squirm: The movement of a tire between the ground and the wheel. This can be side-to-side movement, or front-to-rear movement. Softer compounds typically have more squirm.

Stadium Truck: Designed for backyard fun, or all out racing, R/C stadium trucks are the masters of "bump and jump" excitement. Like full-size stadium trucks they are built to take punishment. They have heavy-duty suspensions, oversized shocks and large tires which enable them to survive the roughest terrain. Yet, when tuned correctly, they also display speed and agility equal to the off-road cars.

Tie-Rod: The rod assembly used to connect the steering bell- cranks or servo saver to the spindles.

Titanium: A metal alloy used to manufacturer parts, such as tie-rods and hinge pins, that is extremely light and very strong.

Toe-in: A condition when the front edge of both tires are closer together than the rear edge of both tires. Toe-in will often times make a car more stable under acceleration and decrease turn-in steering.

Toe-out: A condition when the front edge of both tires are farther apart than the rear edge of both tires. Toe-out increases turn-in steering, yet reduces stability under acceleration and through bumpy sections for an off-road vehicle.

Top End: A vehicle's final acceleration rate, or the amount rpm's available from a motor depending on type of motor and gearing.

"Torquey": A term used to describe a motor's brute strength during acceleration.

Transponder: A small device, that when installed in a vehicle will count your car's laps as it goes by a radio pick-up device.

Traction Roll: If a vehicle has too much traction, it may roll over during a high-speed turn.

Traction Compound: Used to soften foam or rubber tires; used in on-road and off-road racing; a mixture of different chemicals that usually have a strong, unpleasant odor.

Trickle: A low-rate charge, usually below 0.5 amp.

Transmitter (Tx): The hand-held radio controller. This is the unit that sends out the commands that you input.

Turn Marshal: Persons assigned to correcting vehicles that are upside down or stuck on the race track. Racers are usually expected to turn marshal immediately following their race.

Tweak: A condition in which more pressure is applied to one side of the chassis. A vehicle that has a tweak will pull to one side under acceleration and braking.

2-Wheel-Drive vs. 4-Wheel Drive: As in full-scale cars, there are two main drive types: two-wheel drive (2WD) where power is supplied to the two rear wheels, and four-wheel drive (4WD) where power is supplied to all four wheels. The 2WD vehicles are less expensive and require less overall assembly and maintenance than 4WD vehicles. Assembly and maintenance for 4WD vehicles tends to be more involved, though not necessarily more difficult; the trade-off is that 4WD vehicles offer better steering through turns.

Under steer: A situation in which the rear tires have more traction than the front tires. This causes the vehicle to have inadequate steering.

Unsprung Mass: That portion of the total mass of a vehicle which is not supported by the suspension. Unsprung mass is comprised of wheels, tires, hubs, hub carriers, and approximately 50% of the mass of the suspension links, drive shafts and shocks (if mounted outboard).

Vertical Load: The amount of force applied to an individual tire in the direction perpendicular to the road surface; the forward driving force of the tire.

Z-Bend: A simple Z-shaped bend in the wire end of a pushrod, which is used to attach the pushrod to a servo output arm.

Z-Bend Pliers: An inexpensive plier type tool used for easily making perfect Z-bends.