R/C Off-Road Vehicle Setup Checklist

30 August 2018

PRIORITY:
1) Clean car and check for any damage. Fix damage.
2) Check drivetrain, suspension, electronics are operating properly
3) Check setup is correctly applied
4) ONLY ADJUST SETUP AFTER CONFIRMING 1-3 ARE OK

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		What To Check	How To Check	How to Fix	When to Check
1. Vehicle Condition	**Clean**	All parts are clean (easy to see damage on a clean car)	Visual check for dust / mud	Dusty: Blow with compressed air Mud: Clean with simple green and compressed air, simple green and toothbrush or baby wipes	Between runs as much as possible. As soon as possible after race meeting (easy to see damage on clean car, and dirt will seep into bearings / shocks / driveshafts)
	Broken Parts	Check all plastic parts for cracks / damage	Visual check of arms, hubs. Gently twist parts, cracks will open up.	Replace broken / cracked parts immediately.	Between every run.
	Screw Check	Check all screws are tight	Check each screw with appropriate tool	If loose - tighten. If loose into metal part: Re-apply loctite, tighten If screw head is damaged: Replace screw	As frequently as possible (shock screws / motor screws every few runs. Visual check every run)
	Body / Wing	Wing not damaged or rubbing on wheels Body held securely	Wing: Visual inspection for cracks / bent. Cycle suspension full stroke to see if tyre rubs on rim. Check body held on securely.	Cracked wing: Will reduce downforce a lot. Replace wing or tape up crack. Body: Replace velcro or use body post clips	Wing visual: Each run
2. Drivetrain	**Gearbox**	Gearbox is free	Remove pinion. Spin spur gear and check drivetrain spins freely and quietly with no tightspots.	Remove gearbox. Check for worn / missing teeth. Clean, Replace or re-shim as required. Use grease when re-assembling (black or ball diff grease for plastic gears, black grease for metal gears)	Between race meets or if your car is noisy / running slow/ running hot.
	Motor Mesh	Motor mesh is not too tight / not too loose	Take gear cover off. Gently rock spur gear against pinion. Should be some movement (can feel 'tapping'). Rotate spur gear through 360deg, checking mesh several times in case not perfectly round. Need some movement at all points.	Loosen motor screws, tighten or loosen mesh, re-tighten screws and check mesh again. *TRICK* Put a small piece of paper between pinion and spur and tighten motor. A gap the thickness of paper is all that is needed.	1) After removing motor or changing pinion / spur gear 2) If gear sound suddenly becomes noisy (crunching = loose, squeal = tight). 3) Regular check in case of motor movement or gear wear
	Pinion / Spur	Pinion and spur in good condition	Visual check for wear / damaged teeth / dirt in teeth	If dirt in teeth: Use small pick to remove dirt/sand. If teeth severely worn, replace gears. Use loctite on pinion grub screw. Re-set slipper clutch when changing spur gears.	1) If vehicle is noisy 2) Between race meets
	Bearings	All bearings are smooth and free	(Simple) Remove pinion. Spin spur gear and check drivetrain spins freely and quietly. 2wd spin front wheels and check they spin freely and quietly. (Thorough) Disassemble vehicle. Wipe dirt / grease off outside of bearing. Check each bearing is free by putting inner race on end of thumb or finger and rotating outer race.	1) Replace noisy /gritty bearings 2) Can clean and re-oil bearings if they are dry. Clean with motor spray or shellite, and use thin machine oil.	1) Between race days (especially if racing in dusty or muddy conditions) 2) If your vehicle becomes noisy or motor starts to run hot
	Driveshafts	Driveshafts are smooth and lubricated	(Simple) Wipe with rag or brush, check driveshaft is lubricated /not full of dirt. (Thorough) Remove driveshaft from vehicle. Rotate driveshaft with the shaft approx 30 deg to the axle. Should feel smooth with no crunchy / sandy feel.	If dry or crunchy sound: 1) Disassemble driveshaft from vehicle 2) Wipe parts and clean with motor spray and blow with compressor, or shellite in ultrasonic cleaner. Dry parts. 3) If parts are significantly worn / notchy, may need rebuild kit 4) Grease parts (I use AE black grease) and re-assemble. Check for smooth operation and re-install	1) Between race days (especially if racing in dusty or muddy conditions). I do between every race day. 2) Overnight at big events
	Diff	Diff is smooth, tension is correct	(Vehicle together) Turn one wheel while holding the spur gear. The wheel on the other side should rotate in the opposite direction, and the action should be smooth not gritty. There should be some resistance.	Ball diff: Remove and disassemble diff, clean all parts with solvent cleaner. Rebuild with fresh grease, flip drive / thrust rings. If still gritty, may need replacement balls and rings. (Note: must use clear grease designed for ball diffs inside diff, black grease for thrust bearing) Gear diff: Remove and disassemble diff, drain and clean parts with solvent. If gritty, may need re-shimming internal gears. If oil is very black, has probably overheated and lost viscosity. Re-fill with new grease of correct viscosity.	CLICK HERE FOR AUSSIE BUILDS VIDEO Between race meets or if your car is losing traction on exit of corner
3. Suspension / Chassis	**Suspension Free**	Suspension moves freely without binding	1) Remove all 4 shocks and wheels from vehicle 2) Check that suspension arms move freely and fall under their own weight	If binding, disassemble suspension. Hinge pins: Polish pins (use dremel and metal polish such as Autosol). Check pins aren't bent. Arms: Use pipe cleaner to clean dirt out from inside of hinge pin holes. (For new arms, use a reamer inside hinge pin holes). Check that arm will move freely on the hinge pin.	When building a car In between meetings After running in muddy or dusty conditions
	Shocks	Filled correctly Operate smoothly Equal length Equal rebound	1) Remove spring, clean off all dirt (toothbrush or rag) 2) Hold shock vertical. Pump shock in and out. Should be smooth operation all through stroke (if tight spot, look for bent shock rod) 3) Use vernier calipers to check shock rod is same length left/right when fully extended 4) Compress shock and let go of rod. Left/right shock should spring out the same amount	Empty shock / missing oil: Remove cap, drain shock, re-fill with oil Not smooth operation: If bent rod, replace rod. If tight seals, remove and clean / replace with fresh seals. Unequal length: Screw shock rod in/out for equal length left/right (within 0.1mm) Rebound: Bleed shocks equally left/right (AE: With bleed screw removed and shock vertical, slowly compress shock all the way then put bleed screw in while shock rod is at full compression)	CLICK HERE FOR AUSSIE BUILDS VIDEO In between race meets Shock bleed should be done immediately before ANY ride height check, and when temperature changes (I do when I get to track, and several times during the day when racing outdoors)
	Springs	Equal left/right	Check left / right spring are same type, same length Check preload collars are set equally left / right	Install correct springs if different left/right Adjust spring preload collars to be equal left / right (within 0.1mm)	During rebuild
	Anti-Roll Bars	Move freely Set equal left and right	1) Disconnect anti-roll bar ends - check bar is free to rotate up / down with minimal play 2) Check left and right links are same length. With shocks disconnected - lift left arm up, check position right arm starts to lift. Repeat for right arm - left should lift similar amount.	If bar tight - adjust preload (with AE, uses grub screws) If unequal left/right - adjust length of bar ends to have equal lift.	When building new car After changing anti-roll bar
	Geometry	Equal left / right Matches setup sheet	Check ALL Adjustments are equal Left / Right (eg which holes are used, thickness of washers, caster settings, pill settings, turnbuckle settings etc). Check ALL adjustments match to the setup sheet you are using (your own sheet or someone else's sheet) Start from front of car and work backwards	Re-set all adjustments to match your desired setup sheet, and same left/right.	When building a new car After a major rebuild After major setup changes After replacing parts
	Wheels / Tyres	Tyres are clean Wheels are marked	Check tyres for dust / mud buildup Rims should be marked with date, compound, set, left/right	Clean tyres after use (warm water and hard bristle brush, dry. Store in sealed zip lock bag between race meets. Use sharpie marker to mark set	In between races if muddy In between race meetings
	Wheels / Tyres	Tyre bead is glued Wheel is not bent / warped Tyre in good condition	Inspect bead all around tyre by pushing on sidewall. Should be firmly glued all around. Rotate wheel on car, check no warping Look for damage / wear to tyre	Tyre bead: If bead coming unglued, clean bead (methylated spirits) then re-glue and hold tight with rubber band until dry. Replace bent wheels / damaged tyres	Every few runs
4. Electronics	**Steering Travel**	Steering system is even left and right and uses full travel	Place car on ground ready to go. Steer full left, then full right. Steering should just reach full lock in each direction at full steering.	1) Check steering turnbuckle same length left & right (use vernier) at correct toe in 2) Set controller subtrim, trim and expo to zero. Set EPA and travel L/R to 100 3) Set subtrim to straight steering. If needs large offset, may need to re-set servo spline position. 4) Check steering left/right. Adjust EPA so that both directions achieve full lock 5) If one direction is reaching full lock earlier, use steering travel L/R adjustment to reduce that direction until just full lock 6) Fine tune steering trim with normal trim	CLICK HERE FOR AUSSIE BUILDS VIDEO 1) When car is new 2) If making major change to steering system 3) If using new servo or new radio
	ESC	ESC is setup correctly for your radio (neutral / full power / full brake)	Hold car in the air (careful for rotating parts), At neutral: ESC indicates neutral, wheels / motor still. Start to pull trigger: wheels start to move Full throttle: ESC indicates full throttle.	1) Re-set transmitter trim to zero, throttle and brake EPA to 100% 2) Follow manufacturer instructions for ESC calibration	1) When car is new 2) If new ESC or radio
	Receiver	Receiver plugs / wires in good condition	Visual check for frayed wire / chance of being damaged by moving part Check servo and ESC plugs are pushed into receiver correctly	As required - cable ties/ cable routing / cable shortening	CLICK HERE FOR AUSSIE BUILDS VIDEO
	Electronic mounting	Electronics are held securely in place	Try to move electrical parts by hand (ESC / receiver / servo) - all should be secure in place	ESC / Receiver: Remove double sided tape, THOROUGHLY CLEAN the chassis and underside of the part using solvent, let dry and re-apply double sided tape (2 layers for extra shock protection)	Periodically
	Battery / Motor Wires	Solder joints clean, wires good condition, plugs good condition	Solder joints (motor, battery and ESC) - visual check for clean / shiny joints Wires: Visual check for fray / broken insulation Battery plugs: Plug should be tight / smooth fit into battery	Solder joints / re-wire: See video: Battery plugs: 1) Use cotton bud dipped with methylated spirits or motor cleaner, clean inside battery terminals 2) If loose, gently spread battery male terminals for tighter fit	CLICK HERE FOR AUSSIE BUILDS VIDEO Visual check between meetings Clean battery terminals every few months (especially in dusty conditions)
5. Final Settings	**Slipper Clutch**	Clutch is set correctly	Hold rear tyres still on ground, punch throttle, check if front wheels lift (usual setting is tyres JUST lift, without diff slipping sound)	Adjust slipper clutch tension with slipper nut	CLICK HERE FOR AUSSIE BUILDS VIDEO
	Ride Height	Ride height is set correctly	1) Ensure vehicle is at running weight (battery in place, body on etc) 2) Bleed shocks 3) Drop car onto flat surface from around 15-20cm 4) Tap on board or top of tyres gently (settles suspension) 5) Measure under the chassis	Wind spring collars up / down to achieve correct ride height (wind down for higher ride height, up for lower) Wind left and right collars evenly Ride height should be accurate within ~0.5mm	CLICK HERE FOR AUSSIE BUILDS VIDEO Before each race day After making setup change (spring rate / shock position / battery position / changing tyre)
	Camber / Toe	Camber is set correctly (equal left / right, matches setup sheet)	Set ride height on flat board (above) Use setup station (or camber gauge) to check camber (MUST be after ride height has been set)	Adjust turnbuckles to set camber to desired level (within 0.5deg)	CLICK HERE FOR AUSSIE BUILDS VIDEO After building new car After making geometry adjustment After major crash

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