

2.0 Final Assembly of Corally Cars.

2.1 Fitting the centre point steering.

Screw the 2mm bolt outermost centre hole on your servo saver. (not supplied)
A Kimbro or Schumacher servo saver is recommended. Depending on the servo and size of servo saver you choose, the 2mm bolt may need to point towards or away from the servo body. The threaded bushing then needs to be fitted onto the 2mm bolt now attached to the servo saver. The flange of the bush needs to be screwed tightly up against the servo saver arm. Drop the loop on the end of each of the two track-rods, over the bushing. The loops on the track-rods must point upwards, to eliminate bump steer. Once fitted screw the 2mm nut onto the bolt and tighten it up against the end of the bushing. Do not at any cost or for any reason replace this steering system or remove the play at the centre pivot. The tolerances in the track-rod eyelet`s have been designed to aid straight line stability. Fitting `play free' ball joints will change the geometry and make the car really difficult to drive-you have been warned.!!!

Centre point steering explained.

The centre point steering used on all Corally cars has been designed to give the ideal "Ackerman" angles during steering movements which complement Corally`s trailing stub axel design. This basically means that on Corally cars the inside wheel is always at the optimum angle to give neutral steering at all speeds, this drastically reduces wheel scrub and gives superior cornering speeds.

2.2 mounting the steering servo.

To mount the servo you must first remove the mounting tabs on your servo, use a modelling knife or side cutters. (see diagram) Ensure that all the material is removed and the side of the servo is smooth, flat and clean. The servo is mounted vertically. (see diagram.) The servo needs to be mounted using double sided foam tape or contact adhesive (not included) onto the vertical servo plate and the chassis. Before you mount your servo, check that the servo output shaft sits exactly on the centre line of the car. If it does not, then remove the motor plate from the car and add spacers between the plate and the alloy posts it is mounted to. Only fit the servo when you are sure it will sit in the centre of the car. Also before mounting the servo, hold it in the intended position can be found for your type of servo, once the ideal position is found, mark it and then progress with mounting your servo. If you intend to use a body shell with turning vane then you must fit it to the car before mounting the servo. (see the section 2.7 for details)
Sticking the servo to the plate whilst separate from the car is recommended, but remember to leave the posts attached to the plate as you will cover the mounting screw with the servo. Ensure that when mounted the servo does not move during steering operation. If you use a large servo it may be advisable to purchase an additional servo plate and posts so that the servo can be sandwiched between two plates, for added support. An alternative is to use cable ties to clamp the servo to the servo plate.

2.3 Front wheel tracking.

Remove the dummy track rod and fit the ends of the track-rods into the ball joints attached to the steering blocks. Centre the servo, the servo saver should be vertical, then set the front wheels to run parallel straight ahead) and then tighten up the 3mm set screws. The ball joints are designed to withstand crashes and should never need to be popped off the balls, this design prevents the ball joints from being stretched and so getting loose due to servicing

2.4 Radio installation.

In all Corally cars both the Electronic speed control (ESC) and the receiver need to be mounted onto the chassis, using double sided foam tape (not supplied.) Mount the ESC first on the chassis plate next to the nicad pack on the left of the car. It is important that the ESC is mounted in a position which keeps the battery wires to the minimum length, to minimise electrical losses and potential interference problems. Next mount your receiver on the chassis plate to the right of the nicad pack. It is advisable to keep the crystal and aerial wire as far away from the nicads as possible. Thread the aerial wire through the hole in the side of the aerial tube post and then up through the yellow aerial tube supplied. Finally fit the top of the aerial tube for safety.

2.5 Battery pack installation.

The nicad pack on the F1 car is mounted down the centre of the chassis and are held in place by the upper chassis brace, which can be removed in seconds by removing the six plastic clips. Stick pack nicads are the recommended configuration for the car, due to their convenience, the wires should connect to the back of the battery pack and should be fed under the rear damper plate when being installed in the car. Stick the foam rubber pad under the chassis brace so that it grips the nicad pack. This together with the rear damper plate and the servo plate it will prevent the nicads from moving around whilst the car is raced. It is also possible to use saddle pack style or side by side nicad packs in the car without modification if all the cells are glued together or held in place with heat-shrink insulation tubing. If you need or wish to keep the cells loose then fit the optional battery straps to the chassis to prevent the cells from moving around whilst being raced. (part no. #74130,#74131)

2.6 Motor installation and gear meshing.

Bolt your chosen motor in place as shown and fit the appropriate pinion gear to the shaft of the motor, ensure that you tighten the 1.5mm set screw onto the flat on the motor shaft. Please refer to Appendix 1 for the part numbers of additional gears, both pinion and spur. Also refer to the gear ratio and roll out charts, section 8.0 in this manual, for advice on gear ratio selection. Once in place and the gears are fitted you need to adjust the position of the motor, in the slotted holes provided in the motor pod, to ensure that the gears mesh smoothly. A small amount of play is required between the teeth of the gears as they engage, turn the axle to ensure that they mesh consistently around the whole spur gear. Once in position tighten up the 3mm Torx screws to hold the motor firmly in place. Please note that there are two types of gears available for Corally cars. One is 48dp which offer good efficiency and great durability, whilst for the serious racer there are 64dp gears which have a much smaller tooth form and so offer greater efficiency at the expense of durability.

2.7 Mounting your bodyshell and wings.

It is recommended that you use a lexan/polycarbonate bodyshell (not provided in rolling chassis kits) as they are lightweight and robust. See the set-up section later in this manual for advice on bodyshell selection and other aerodynamic considerations. It is advised that you mark the outside of the bodyshell with bodypost and aerial positions, before you spray paint it on the inside. The Corally body mounting posts fitted to the car are fully adjustable and are suitable for any F1 bodyshell. Optional longer body mounting posts are available for saloon, sedan or NASCAR body shells. (see the tune-up parts-Selection 6.) The bodypost screws are fitted with sleeves which have been designed to allow the bodyshell to 'float' a little. This design helps in the event of a crash or when the bodyshell is accidentally run too low. With F1 cars you will need to fit front and rear wings. Most wings available will fit the car and simply need to be bolted to the chassis and the rear wing mounting bar. In Corally complete car kits there is a fully adjustable rear wing with three elements (see diagram) You will need to trim and bolt the moulded lexan wing profiles to the side plates which have a range of holes for each element to allow you to tune the Aerodynamics of your car. Once assembled fit the wing to the moulded support, which gives superior down force, using the self tapping screws provided. Depending on the body set you choose you may need to fit turning vanes into the top of the chassis, using double sided foam tape. For added security it is advisable to bolt the turning vane under the servo posts. Trim the turning vane moulding around the position of the servo, so that the servo can be stuck directly to the chassis.

2.8 Final checks.

The differential must be checked before you run the car, it must not slip under acceleration. See the Maintenance and technical information section for diff. adjustment instructions.

BEFORE RUNNING YOUR CORALLY CAR, CHECK ALL SCREWS ARE TIGHTENED READY FOR RACE CONDITIONS. The cars are assembled with automatic tools with a low torque setting, so that you 'can' undo them in the future.

3.0 MAINTENANCE AND TECHNICAL INFORMATION.

3.1 Tweak.- left to right balance of the car.

One of the most important factors when racing an R/C car on-road is 'Tweak'. If a car is 'tweaked' then the car will turn differently in left and right hand bends. Purposely tweaking a car may be advantageous when oval racing, but generally its best if the car handles exactly the same in both left and right hand turns.

A car becomes tweaked when the grip or weight is not balanced between left and right hand wheels. This may occur in several ways.

(I). The chassis assembly could be twisted, this is no longer common in modern cars, but should be checked after major crashes.

(II). The tyres on each side of the car could be different sizes. The outside tyre generally wears more quickly than the inside tyre, so to prevent problems swap the tyres from left to right hand sides after every couple of races.

(III). The suspension or ride height may not be set the same on each side of the car. Check spring, Tweak adjuster settings and ride height spacers.

(IV). Steering movement may be giving different of left and right sides.

(V). Tyres may be giving different grip levels. Check and replace any that seem to have different degrees of firmness. (This can occur with over use of tyre additive).

(VI). When using tyre additive to each tyre.- Be careful.!

(VII). Finally its possible for the car to feel tweaked if the suspension does not move freely. Check that the power wires to the motor do not restrict the rear suspension movement and check that all ball joint move freely.

3.2 Tweaking Corally cars.

Corally cars have been deigned to be tweak free and so most of the above points do not apply.

"We do try to make our cars as consistent and easy to use as possible. The only headaches a Corally driver should have are those the morning after the victory celebrations." - Constant Paul. President of Corally RC B.V.

Corally cars have fully floating rear suspension systems which are designed to give maximum traction and negate tweak effects. This rear suspension is complemented by Corally's revolutionary anti-roll front suspension and fully sealed isotropic rear silicon damper.

On the rare occasions that Corally cars feel tweaked, check the tyres, their additive, the steering travel and make sure the motor wires are not catching on the radio plate.

It will only be necessary for you to de-tweak your Corally car if you choose to fit on optional Tweak adjuster, see the later section which fully explains this option.

3.3 Ride height adjustment.- the gap between the chassis and the track.

The ride height should be kept to a minimum, this will keep the centre of gravity of the car as low as possible and so maximise cornering speeds.

The ride height should ideally be between 3-5mm (1/8"-3/16"), but on bumpy tracks or where regulations dictate otherwise run the car a little higher. Check regularly to compensate for tyre wear which can be rapid on some tracks.

3.4 Adjustment to the Front.

Each front steering block is supported by four aluminium washers. Placing these under the steering block lowers the chassis (less ride height) and conversely putting them above raises the chassis, giving more ride height. (see diagram).

On road courses always use the same washer position on each side of the car. On oval courses it may be advantageous to offset them to 'hook' the car into the turns.

3.5 Adjustment to the rear.

Three different of rear axle bearing holders haven been included in the kit, they ar all off-set to give 6 different rear axle height settings. (see the diagram).

Remove the rear axle by loosening the set screw in the alloy left wheel hub, or by removing the centre wheel clip when using Corally style wheels.

Fit the appropriate pair of bearing holders to each end of the rear axle tube, complete with bearings and replace the axle. Do not forget to re-mesh your pinion and spur gear. Always use the same height setting both side of the car otherwise the rear axle bearings will lock up.

Rear bearing holder positions. (note-the ID numbers.)

3.6 Rear Axle end float adjustments.

In order for the rear axle to run freely, a very small amount of 'end float' is required between the alloy differential drive plate and the rear axle bearing. 0.5mm or 0.002 should be about right. If there is insufficient end float, then loosen the set screw in the left hand wheel hub and adjust accordingly, tighten and check again.

3.7 Front Damper servicing.

The Corally F1 is fitted with a silicon front damper which controls the movement of the front suspension. The black plastic damper housing slides up and down the alloy damper post which is fitted to the chassis between the wishbones. Damper syrup is applied between post and the housing and can be topped up by removing the dust cover from the top of the damper and adding more syrup.

It is possible the change the amount of damping effect by using different amounts of either the standard or hard syrup. From time to time give this damper a full service, by removing the wishbones and taking it completely apart. Clean the post and housing, apply fresh syrup between the two o-rings on the post and reassemble.

3.8 Rear Damper servicing and adjustment.

The rear damper is a very important part of a Corally car. This damper controls the rear suspension movement and as it is fully sealed with rubber gaiters, should require little maintenance. Periodically check that the movement of this damper is even and smooth in all directions. To do this remove the two screws connecting the damper plate to the rear motor pod.

To change the damper action (stiffness) you will need to add or remove some damper syrup.

To increase the stiffness, increase the damping effect, pull back the top gaiter, when flipped inside-out it will stay out of the way while you work on the damper. Alternatively during major re-builds (once every six months or so) remove the roll mast or clip on top of the damper post and remove the gaiter, spring and washers altogether. Now lift the top grey

damper washer and add some damper syrup around the damper post, on top of the lower grey damper washer. Reassemble the damper, refit the rubber gaiter around the damper and test that you have the desired damper effect. To reduce the damper effect as above, but remove damper syrup using a cotton bud or paper towel.

Tip - Repeated testing of the damper by hand may reduce the damper effect, the reason being that on the track the damper only actually moves small distances. When testing by hand, it is usual that the damper is tested over the full damper, away from the normal area of operation.

3.9 Rear oil filled damper maintenance. (Pro Graphite kits only.)

The oil filled damper fitted to the Por-Graphite car needs to be serviced from time to time, to ensure that it give a smooth consistent operation. To service the damper remove it from the car, remove the end cap from the shock and empty the oil. Next remove the spring from the shock body by depressing it and sliding the moulded spring seat off the side of the ball joint. Remove the ball joint from the end of the shock shaft, be careful not to scratch the shaft, it is critical that it is smooth to give a smooth shock action. Press the shaft into the shock body, remove it completely and clean with paper towel. Clean out the dirty oil from the shock body with a paper towel or cotton bud. The oil filled in the factory is silicon 20wt. Check the rubber seals in the end of the shock where the shaft slides, if the seals or the shaft are damaged the replace. To remove the seals you will need to use a pair of C-clip pliers (not included). Reassemble the shock in the reverse order, as to that above, before you refit the spring you will need to fill the shock with fresh oil. Only use good quality silicon oil as this does not change its viscosity due to temperature. Changing the grade of the oil will change the damping effect, see the set-up section for further details. Fill with oil to the top of the shock body and then slowly push the shaft up and down until all air bubbles are removed. Screw the end cap in place but not tight up against the outer sealing O-ring, push the shaft half way into the shock body and then fully tighten the end cap against the seal. Some excess oil will probably leak form around the seal this is to be expected, wipe this clean with paper towel before fitting the spring. Test the operation of the shock by hand it should be smooth and consistent throughout its travel. If the shaft cannot be pushed fully into the shock then it is over filled with oil, loosen the end cap depress the shaft, the excess oil will leak out and then the end cap be tightened again. If there is air in the shock then you will feel it when testing the shock by hand, if so add more oil and repeat as above.

Oil-filled shock absorber.

3.10 Corally Differential adjustment and maintenance.

When using US style wheels loosen the set screw in the alloy left wheel hub and remove the axle. When using Corally wheels the clip in the middle of the left hand wheel is removed to withdraw the complete axle from the rear motor pod. The differential can be serviced whilst in the car or as a separate unit.

Adjusting the differential.

To test the diff. hold both rear wheels then try to turn the spur gear with your right thumb. If the gear turns without extreme force then tighten the knurled diff. nut in the centre of the right wheel a small amount. Repeat this process until the gear turning even when the nut is very tight, then you need to service the differential.

Next hold the spur gear and turn one wheel, the other wheel should turn smoothly in the opposite direction. If the diff. feels stiff or rough then servicing is required.

If you are using Corally wheels then you will need to remove the right hand wheel to expose the knurled nut for adjustment, this is simply a case of removing the clip in the centre of the wheel.

4.0 Servicing the Differential.

Unscrew the diff. nut and carefully remove each component, making careful note of the order in which they are fitted. (refer to the sectional drawings if necessary). Check the bearings in the centre of the spur gear, the driver plate and the wheel hub, clean of necessary. Clean the 1/8" balls, the spur gear, the bearing holder and thrust bearing. Worn diff. balls are often the cause of poor differential action, so if they are old or if the diff. has been slipping a great deal, then try a new set. (part no #1008). If you suspect that the diff. washers are worn then firstly try building the diff. with the washers turned over so that the balls run on the other face of the washers. If you have already done this once or if the diff. still feels rough then replace them. (#1002)

Now clean and degrease all the diff. washers. In Corally diff's the large diff. washers sit on large O-rings, these grip the washer to prevent slip and ensure an even pressure on each diff. ball, thus making sure the spur gear runs true. It is critical that these O-rings are free from grease otherwise they cannot grip the washers and the diff. will slip under acceleration. Degrease these O-rings and fit the sceaned washers. Put a small amount of damper syrup or silicon grease on the exposed surface of these washers, where the 1/8" spur gear and thrust bearings will run. Reassemble the complete diff. in the reverse order to that detailed above. Be careful not to get any grease on the O-ring kor the back of the washers, if you do - STOP, and go through the degreasing process again. To degrease use mentholated spirits or motor cleaner, allow the residue to evaporate before continuing.

4.1 Ball pivot servicing.

Corally cars utilise simple, but highly effective ball pivots on the suspension systems of their cars. It is important that the movement of these pivots is free and smooth. To remove the suspension or service the ball pivots simply remove the large retaining rubber O-ring and lift away the suspension beam or T-bar. The plastic socket can then be removed in two pieces. Please note that at the Corally factory these ball pivots are matched in sets to ensure that smooth, play free movement is maintained. Do not mix the ball and socket sets. Check the system for play or binding, if the pivot system is worn or damaged then replace. If there is play between the moulded socket and the suspension beam or T-bar, then fit a larger O-ring or a shim under the O-ring to remove the play. It is not usual for play to be evident unless a much thinner suspension plate is fitted. Shims can be made from Lexan, card or thick paper if necessary.

5.0 Set-up Tips - from the World championship winning Corally Team.

Tweak, getting the car to turn evenly in each direction, has already been covered, however most chassis tuning is done to give a good balance between front and rear traction.

Too much front end traction will cause the car to turn too fiercely or even spin, this is referred to as `Oversteer` or `Hooking`.

Too much rear end traction will cause the car to turn far less than the front wheels are actually asking it to do. The car will `push` or `understeer` wide in the turns. The car will also scrub off speed due to the extra lock on the turned front wheels.

It is critical that you tune your car to give a good balance between front and rear grip. The ideal situation is for the car to negotiate the turns without under or oversteer. The minimum of steering lock should be used as this will ensure that the car carries its speed through the turns.

Corally cars are designed to give maximum traction, with neutral and stable handling. This is a good starting point on most tracks, but not all tracks or conditions are the same, that's the fun with R/C car racing!!! Your track is no doubt different to the Corally test track and your driving style is probably different to that of World Champion David Spashett and multiple European Champion Oscar Jansen, our primary test drivers. We have thoroughly tested with numerous drivers, on numerous tracks, our cars are the result and we consider them to be best around.

The following section will give you a few tips as to the setting up of your Corally onroad racing car for all the conditions you are likely to encounter. Each possible adjustment is explained in detail and the brief summary at the start of each section should help you choose the best solution.

Basic chassis set-up.

Most of your subtle adjustments will be done with tyres, (explained later) but the car must be OK first.

5.1 Rear damper set-up.- controls the speed at which the rear suspension moves over bumps and through turns.

- o If the car is poor over bumps then increasing the rear dampening effect may help.
- o Increasing the rear dampening effect will also increase steering a little, remember this when making this adjustment for other reasons.
- o If the inside front wheel goes light or even lifts during cornering then the damper is too thin.
- o If the car is reluctant to change direction quickly enough in chicanes then reducing the rear damper effect may help.
- o Usually a firm rear damper is best, particularly as the grip of the track increases and generally once set, should require little maintenance.

General rule- if the car understeers whilst exiting corners then the rear damper is set too thin. If the car oversteers exiting corners then the damper is too thick.