Foreword

This is a transcribed copy of the original Reynard manual for the 88FF and 88SF racing cars.

It has been transcribed from a copy of the original and is not complete. It contains many of the typos and grammar errors contained in the original. These are found mainly in those spots of the manual where the original intent of the writer isn't clear. It also does not contain many of the diagrams that are referenced in the text. If anyone has them and would send them to me I'll include them.

This manual is an attempt to help those owners of these cars that don't have access to any of the original technical information that was provided by the factory.

I make no claim to the correctness or usefulness of any of the information contained herein. You use it on your own and must make your own common sense decisions regarding its correctness and usefulness.

I also make no copyright claims to any of the information contained herein. That distinction belongs to Reynard Racing Cars.

You can contact me at: reynardthefox@mac.com

Please visit the Reynard Owner's and Driver's website at:
http://homepage.mac.com/reynardthefox

Technical Manual Reynard 88F/88S

These notes should help the builder to assemble a damaged car in correct sequence and to correct tolerance and fits. Careful, painstaking assembly is extremely important to extract the ultimate performance from the car without obscure handling problems. Reliability, ease of adjustment and maintenance reduce operation are also benefits of perfect assembly. It cannot not be over emphasized that if the build is not perfectly carried out during the assymbly, the problems of difficult adjustments and fits will plague you all through the busy season when time never seems available to catch up. Do not overlook any points on the notes, but you may like to add personal preferences.

1.0 Initial Instructions

Chassis Preparation

All threads on chassis must be tapped out and free from paint after stove enameling. All threads are UNF – leave lightly greased.

All mount holes on chassis for wishbones, seatbelts, mounting plates etc, should be lightly drilled or reamed out to accept the appropriate bolt so that it is a free sliding fit and then left lightly greased.

All wishbones and drop link threads should be tapped out to a depth of at least 35mm. After tapping, threads should be thoroughly cleaned of swarf with petrol and blown out with an airline. Generously relubricate with grease such as Copperslip. All threads are UNF. See Appendix for all thread sizes.

2.0 Build Order

Chassis preparation stages 1-3, then assemble in following order:

Skid plates
Seat belts
Fire Extinguisher System
Dashboard and wiring
Pedal assembly: clutch and throttle pedals, brake pedal, balance bar and adjuster, clutch master cylinder and bell crank.

Front bulkhead: master cylinders, steel inserts and bushes, rocker bearing housing and front beam, pedal stops, front ARB.

Cables: clutch rod, rear ARB adjuster, throttle and brake and clutch line aeroquip, gear linkage, fuel tank and fireproof bulkhead, sub-assembly steering rack and fit

Front suspension and corners, steering wheel and column, nose frame, cooling system, sub-assembly gearbox with bearing housing, rear beam, damper and wishbone brackets and rear steel skid plate.

Bolt engine to gearbox and fit unit into chassis.

Rear suspension, corners and drive line, v-brace, RARB, oil system and engine ancillaries, body, tracking.

3.0 Pedal Assembly

The pedal pivots and channel in the chassis should be checked for clearance and Coppersliped. The pedals should freely pivot on their inserts. The 1/4" bolts should be tightened using Nylok nuts. Ensure the pedals still pivot freely when the bolts are tight.

Lock wire the 2BA bolt into the throttle pedal holding the throttle cable.

Fit the brake pushrod extensions to the brake clevises, securing with Loctite 242, and assemble the balance bar so that the trunnions rotate freely in the clevises and thebrake balance bar thread rotates freely in the trunnions. Ensure that the brake pedal freely accepts the balance bar and that the whole assembly is lubricated with Copperslip. Use 3/8" penny washers between the brake pedal and clevises to keep grit out of the balance bar assembly.

Assemble with the longer thread of the balance bar towards the throttle pedal side and allow a total axial end float of 3mm between the inside of the clevises and the outside of the pedal, ie. 1.5mm each side.

Fit throttle stop as supplied and adjust so that the throttle touches the stop as full throttle is reached but without excessive tension on the cable. Correct throttle stop adjustment is critical to avoid throttle cable breakages and this should be checked frequently.

Tap out the pedal pad threads 1/2" UNF and ensure the pads are easy to adjust. To assemble adjustable brake balance, fit control knob into the dashboard. Check cable and fitting for freedom of movement. Pedal end of cable fits on the right hand side of brake balance bar, locked using 3/8" quarter nut as supplied. The cable should pass in front of the throttle pedal and be secured to the right hand diagonal chassis rail with clips provided.

Locate ball joint and extension for clutch rod on the top hole on the clutch pedal.

4.0 Front Bulkhead

The front bulkhead can be sub-assembled off the car and fitted to the chassis as a complete unit.

Press the front wishbone bulkhead bushes and damper top-hat spacers into the bulkhead casting, using Copperslip to prevent galling.

To attach the master cylinders, remove the rubber dust caps from the pushrods before bolting the master cylinders to the casting. The front brake master cylinder is 5/8" diameter and goes on the right hand side. The dust caps can be replaced after the master cylinders are fitted.

NOTE: when fitting the master cylinder pushrods into the pushrod extensions, ensure that at least six threads are engaged. A hole is provided in the extension for checking this requirement.

Fit a circlip to each rocker bearing housing before pressing in the ABY8 spherical bearings, using appropriate press tools to ensure that the bearing is aligned correctly. Fit the second circlip, ensuring that it is properly seated.

Attach the bearing housing to the castings with 5/15" UNC cap screws ensuring that a minimum of 5mm of plain shank protrudes into the casting. Secure the cap screws with Loctite 242.

Press two ABT8 spherical bearings into the ends of the front beam so that the outer housing is flush with the face of the beam and secure with 2BA bolts and washers. Attach the front beam to the casting with suitable 5/16" UNC bolts with minimum of 5mm plain shank protruding into the casting.

5.0 Steering

The steering rack should be lubricated with a light grease or EP80 oil.

Ensure that the lock stops are fitted to prevent damage to the rack at full steering movement.

The steering pinion axis should be carefully aligned with the steering column and the column fixed to the pinion with a plain shank bolt. Do not use a fully threaded bolt as this can result in the spline pulling out of the joint through exposed threads.

The steering rack housing is clamped by the rack mounting blocks. Care should be taken to ensure that the blocks do not clamp the housing excessively or heavy steering will result. The blocks can be lightly reamed if necessary to ensure free movement of the rack.

Set the steering rack clevises so that the shoulder at the back of the clevis is 12mm from the end of the rack.

Ensure that the correct high-angularity spacers are always used above and below the track rod outer spherical rod end.

To adjust bump steer, either add shims between the upright and the high angularity spacer, or add shims under the steering rack mounting block. If the latter method is used, always use the same amount of shim on both sides and vary the shims on the upright to achieve the desired bump steer.

Adding shims under the rack mounting blocks will increase toe-in on bump.
Adding shims under the high angularity spacer will increase toe-out on bump.

6.0 Anti–Roll Bar System

IMPORTANT: these should be free to rotate in their journals when tightened. The clamps can be bored or reamed where necessary. Up to 0.020" clearance can be tolerated. Lubricate with Copperslip. As a guide the ARB should fall or rotate under its own weight – if it sticks it is too tight.

Adjustment of the FARB is provided by sliding clamps fixed position by UNF clamp screws. Shortening the lever arm stiffens the bar and lengthening the lever arm length softens the bar.

NOTE: Ensure that the UNC bolts securing the FARB blocks have sufficient plain shank to extend 3-5mm into the bulkhead casting.

Adjustment of the RARB is provided by a driver adjustable blade. When the blade is vertical, the bar is full stiff and when the bar is horizontal, the bar is full soft. Adjust the cable length as necessary to gain the full range of movement.

7.0 Front Suspension Assembly

Front Rocker – 88F 88013 RH, 88F 8012 LH

Ensure that the outer spherical bearing housing is clear and free from burrs and press in PP0061 bearing. Although the bearing and housing are machined to a very accurate fit, some distortion due to welding is inevitable. If the bearing is not aligned correctly at the beginning of the fitting operation, a burr will be cut from the bearing housing as the bearing is pressed in. If this occurs, remove the bearing and polish out the burr and start again.

When fitted, secure the bearing with its circlip ensuring that the circlip is fully seated.

Attach the rocker by two rocker pivot bolts BBF0098 using Loctite 242 to retain the thread and a small amount of Copperslip on the plain shank to stop the bearing from locking on to the bolt.

Bottom Wishbone BBF88014

Fit a PP0076 rod end to the forward leg, a PP0084 joint to the rear leg and a PP0077 joint to the outer bush of the front wishbone with the joint extensions per the joint setting diagram.

Attach the PP0076 joint to the front bulkhead/front wishbone bush, followed by a high angularity spacer, front wishbone spacer and FLWB forward pickup plate.

Attach the PP0084 joint to the chassis bracket using a suitable 5/16" UNF plain shank bolt.

8.0 Front Uprights

BCC0002 (RH) BCC0001 (LH)

The front uprights are a lightweight steel fabrication incorporating a large diameter double row ball bearing race and lightweight alloy wheel flange.

To build an upright, first fit the inner bearing circlips BBC0045 and ensure that it is correctly seated. Using appropriate press tools to ensure that the bearing is seated squarely, press bearing into upright and fit outer bearing circlip ensuring that it too is fully seated.

Clean threads thoroughly using acetone, then screw the wheel stud into the wheel flange retainer and secure the thread with Loctite 648.

Support outer end of bearing inner race and press in wheel flange retainer with wheel stud. Failure to support bearing correctly will cause irreparable damage to the bearing.

Fit wheel flange BBC0049 and wheel spigot BBC0041 retaining these with M8 x 70 mm cap head bolts, tightened to 26 ft-lbs and lock wired.

Fit brake discs BBC0039 securing with wheel drive pegs and check alignment and clearance. Max disc axial run out is 0.1mm. Rotating the disc by 90 deg. On the wheel flange may influence this run out.

Fit calipers and check for correct centering on disc. The calipers are handed so ensure that the bleed nipples are at the top of the calipers when fitted.

When fitting uprights to the suspension ensure that the correct safety washers are sued ABC0051 (BCF0001 –USA) top and BBF0095 (BCF0002 – USA) bottom and lock wire the retaining bolts.

9.0 Rear Suspension Assembly

Rear Rockers BBG8017 RH, BBG8018 LH

Assemble and attach rockers as per front rockers only using two PP0077 rod end joint and locknut at the outer pickup point. Fit damper top-hat spacers BBK0051 to the PP0077 joint before fitting to the upright.

Rear Wishbone

Fit a PP0061 joint and circlip to the outer bearing housing, a PP0062 joint and circlip to the inner housing and a PP0085 rod-end joint and locknut to the forward inner bush using appropriate press tools and fitting procedure for the housed joints as for the front rocker.

Fit wishbone spacer bushes BBY0183 to the inner joints and attach to wishbone brackets on gearbox.

Tap out threads in rear toe-link and fit PP0080 and PP0079 rod-end joints with locknuts. Fit toe-link spacers BG0055 to the PP0079 joint and attach to lugs on rear wishbone.

BCE0001 LH/RH

To build a rear upright, follow the procedure for a front upright, but, fit the V.C. Drive Bell BBE0046 in place of the wheel flange retainer and fit six M8 x 70mm cap head bolts. Tighten to 26 ft-lbs and lock wire.

10. Driveline, Gearbox and Gear Linkage

The Reynard 88F/88S features a purpose built gearbox casing, incorporating the bellhousing, rear suspension mountings, oil tank and clutch actuating mechanism. The internals of the gear box are standard Mk9 Hewland with the following exceptions.

1. The clutch shaft has a support bearing in its mid-point, ensuring perfect clutch alignment and eliminating the need for a draw bolt inside the gearbox input shaft.

2. The top gear thrust force is supported by a flanged bearing hub mounted on the mainshaft, rather than against the selector housing casting. This provides better control of the top gear end float and reduces friction.

3. The crown wheel and diff carrier are lightened.

4. The output shafts are Reynard designed and Hewland manufactured and are 400 g lighter than the standard items.

5. The output shaft bearings are narrower and lighter than the standard Mk9 units reducing both weight and friction loss.

All non-standard Hewland parts are listed on the assembly structure and are available from Reynard Racing Cars.

For exchanging gear ratios and servicing the differential the procedure is as per standard Hewland Mk9 with the exception of the draw bolt, which isn't there and the aforementioned top gear thrust bearing.

Fill the diff housing with 1 liter of FP90 gear oil and the gear casing with 1 liter of FP90. When changing gear ratios, only 1 liter is needed for re-filling. In cold weather use SAE20-50.

The clutch operating mechanism utilizes a separate machined clutch piston housing which fits into the gearbox casing. See Drg. 87F-13-1.

The assembly procedure is as follows:

1. Fit oil seal to clutch piston housing, using appropriate fitting tool to avoid damaging the seal. Note correct orientation. See Drg. 87F-13 attached.
2. Fit bearings and retain with circlip.
3. Fit inner O-rings to clutch piston housing, lubricating with rubber grease.
4. Fit clutch shaft into clutch piston housing and bearing and retain with circlip. Lubricate seal face on shaft with engine oil before fitting.
5. Fit outer O-ring to clutch piston housing, lubricate with rubber grease and insert assembly into gearbox casing, installing muff-coupling and retaining circlip inside diff housing at the same time. Fasten piston housing to gearbox casing with three M6 cap screws and fit 2 clutch piston pins, retaining with Loctite 242.

Bleeding the system is straightforward, with pressure being fed in at the sid of the casing and the bleed nipple at the top.

Apply a sealing compound, eg. Hermetite Liquid Silicon gasket to both CV outer mating faces before bolting the joints to the CV outer bells and the gearbox drive flanges. The will prevent grease loss through centrifuge.

The CV joints are subject to tremendous heat from both the gearbox and brakes which tends to dissipate the grease into non-existence. Inspect the joints regularly and re-pack at least every five races. Do not overpack. Even minor damage to a rubber boot can cause rapid grease loss and consequent CV joint failure.

Torque the outer M8 x 45mm long allen socket bolts into the CV bell flange to 26 ft-lbs and lockwire around the periphery. Torque the inner gearbox nuts to the same torque ensuring the CV joint is located accurately on its distance spacer. Check all driveshaft nuts and bolts each race.

When fitting the driveshaft it is best to fit the inboard, ie. Gearbox , end before attaching the outboard, ie. Upright, end to the outboard CV joint bell.

Check driveshaft plunge movement throughout its full wheel travel. At least 6mm axial movement should be available at all points of suspension displacement. This movement will be very stiff with new joints.

All gear linkage threads should be tapped out and Copperslipped. Ensure the reaction bar slides freely in the yoke and assemble well Copperslipped.

The rear bent shaft with the two U/Js should be located in a position to provide sufficient angular and fore-aft movement without fouling. Locate this near the end of the assembly with all the parts in position. When perfect, drill centrally on diameter, two 3/16" holes, vertically through the Hewland shaft rear U/J and gear rod shaft front U/J respectively. Ensure the bolts are easily removable in situ and shorten the bolts to a minimum length to be just nipped by Nyloc nuts.

Ensure that the gearshaft linkage and all U/Js and fastening bolts do not foul the chassis or suspension in any position. A particular point to check is the Aft Shaft Linkage on the rear wishbone bracket bolt.

Lubricate the U/Js with Copperslip. Relubricate frequently especially after wet races.

Remove all swarf and filings from the clutch quillshaft and Copperslip the splines lightly.

11.0 Engine Installation

The engine is best installed and removed as a unit with the gearbox.

The oil system is very simple. The oil level should not be over filled and should be dipped immediately after the engine has been run to prevent oil running back into the sump. The correct oil level as measured from the very top of the screwed filler is 10". Any attempt to overfill will lead to an excessive amount of oil deposited in the catch tank. The oil system will take approximately 5 liters.

It is good practice to purge oil lines, tank and cooler if fitted, prior to fitting, particularly from new. Should the engine run its bearings the oil will have to be replaced as it is impossible to guarantee that it will be free from debris.

When fitting an engine, always 'crank up' oil pressure, prior to starting. To do this, fill the oil tank to the correct level and prime the oil filter. The fuel and water systems can also be partially bled at the same time, so ensure that the water is topped up and that there is at least a gallon of petrol in the fuel tank. Remove the spark plugs from the engine and with the ignition switch off (or the coil wire removed), turn the engine over on the starter motor. As the oil pressure comes up, the engine will slow and the oil pressure guage will

begin to register. If after approximately 15 seconds the oil has failed to circulate, slacken the oil union that returns the oil to the block.

Spin the engine over on the starter motor and as oil seeps from the union, re-tighten. Finally, re-check oil level in tank, refit spark plugs and start engine. On starting engine, check oil pressure and make sure all unions are tight. Bleed the water system and with engine at working temperature, re-check all hoses for security.

The water system utilizes two radiators with the water flowing in parallel, ie, through both radiators simultaneously.

To achieve correct engine running temperature, the outlet of the side pod can be partially blanked off with an aluminum panel in cooler weather. Detail attention to sealing off the radiator will help maximize cooling efficiency in hot weather. The engine should operate at between 70 and 80 degrees centigrade.

Check for full throttle and that the throttle returns fully and smoothly.

The starter motor is a pre-engaged type and utilizes a special cast mounting and extended starter pinion shaft. It is essential for a reliable operation of the starter motor tha the starter pinion is a loose fit on the starter output shaft and drive pin and in the spigot bearing in the gearbox casing.

Drive is transmitted from the starter output shaft to the pinion shaft by a 3/16” spring pin which locates with the starter output shaft and is a loose fit in the starter pinion shaft.

12.0 Oil System 88F/88S

Reynard 88F Ref: Drg. 87F-1

The 88F features a 5 port oil pump. The pump is divided into two sections, one pressure (A/B) and one scavenge (D/E).

The scavenge pickup port (D) is fed from the sump and come ready fitted by the engine builder.

The oil is returned from ports D and F to the oil tank using the lower oil tank union (N).

If an oil cooler is fitted, it should be placed in the scavenge system between ports F and N.

The pressure side of the pump (port A) is fed by a 5/8” feed pipe connected to the bottom of the oil tank (union G).

The oil is then fed from port B, under pressure to the oil filter entry port (H) through the oil filter and out of the filter exit port back into the engine via the oil pump port C.

Reynard 88S Ref: Drg 87S-11

The 88S features a 5 or 6 port, twin scavenge oil pump located at the front, left hand side of the sump. The pump is divided into three sections, one pressure (A/B) and two scavenge (C/D and E/F).

The two scavenge pickup ports (C and E) are fed from the front (Q) and rear (R) of the sump and come ready fitted by the engine builder.

On a 6 port pump, the oil is returned from ports D and F to the oil tank using the lower oil tank union (N). This oil pipe is 5/8" and carries a 2 into 1 oil scavenge junction. The other end is open and attaches to the oil tank with a jubilee clip.

If an oil cooler is fitted it should be placed in the scavenge system between ports D and N.

The pressure side of the pump (port A) is fed by a 5/8" feed pipe which carries a 45 deg. union, with the other end being open and connected to the bottom of the oil tank (union G with a jubilee clip.

The oil is then fed from port B, under pressure to the oil filter entry port (H) via a 1/2" x 11 1/4" pipe carrying one 90 deg. and one 45 deg. union.

The oil is passed through the oil filter and out of the filter exit port back into the engine block.

13.0 Build Order

88F

1. Engine side panels
2. Cockpit sections
3. Fit side pods
4. Nose
5. Tail section

Assemble the panels on the car in this order taking care to ensure that the body is mounted square on the chassis and with adequate clearance on all moving parts, eg. steering and suspension parts, driveshafts, gearlinkage. Fix the panels to the chassis and to each other with race tape and check alignment and fit of the body as a whole before fitting any Dzus fasteners, body clips etc.

The body panels are located and attached as follows:

1. Side pods – align rear edge with rear of aluminum side panels. Fix with countersunk 1/8” rivets at pre-marked postions along top edges and with 5/32” rivets and washers through aluminum angle along bottom edge. When fitting the side pods, the height of the top edge of the side pod can be adjusted by adding spacers between the top chassis rail and the top of the side pod, to ensure that the side pod is a neat fit against the bottom edge of the cockpit section. The operation should be completed before fitting the radiators. When fitting the radiator side pods, ensure that the side pod is set at the correct spacing, top to bottom, before riveting the radiators in place.

2. Cockpit section – locate and align cockpit section on spigots on top edge of side pods. Secure with two Dzus fasteners through flanges underneath front rocker fairings.

3. Rear under floor - fit under gearbox and above skid and aluminum angle around rear chassis. Secure with six 1/4” UNF countersunk setscrews. Attach rear side stays to gearbox and drill through side stays and rear under floor. Attach with 2BA button head screw and nyloc nut. The front edge of the engine side panels should be butted up against the rear edge of the aluminum side panels. The position of the engine side panels then determines the longitudinal positioning of the rest of the bodywork.

4. Tail section – the tail section is located by the wing pole bracket and fastened by three over-center clips to the cockpit section. The position of the wing pole bracket by be adjusted on the gearbox to achieve a good fit against the rear of the cockpit section. The front and rear wings can be attached to the nose and tail sections respectively after fitting.

The front and rear wings can be attached to the nose and tail sections respectively after fitting. When attaching rear wing, ensure that the wing endplates are aligned with each other and the maximum height of 900mm above the ground with driver on board is not exceeded. Also that the maximum overhang behind the rear wheel centerline of 800mm in not exceeded.

14.0 Appendix

14.1 Torque Settings

Thread Size	Torque ft-lbs (half nut)	Torque ft-lbs (full nut or full thread depth into casting)
1/4” or M6	5-6	8-10
5/16” or M8	10-12	18-20
3/8” or M10	20-22	32-34
7/16”	40-42	68-72
1/2” or M12	50-54	78-82
3/4”	80-85	110-120
CV joint drive shaft bolts		26
Wheel flange retainer bolts		26
FF2000 centre bolt wheel fixing		120-130

14.2 Special Tools Required

ABWT10 Bearing Fitting Tool (part no. 86SF-19-02)
ABWT8 Bearing Fitting Tool (part no. 86F-19-02)
Torque-wrench 20-120 ft-lbs
Lockwire soft 0.8mm
Copperslip
Bearing housing and thread Loctite, 648 and 242

Taps:
2BA, 1/4”, 5/16”, 3/8”, 1/2”, 5/8” UNF Righthand
3/8”, 1/2” UNF Lefthand
1/2”, 5/16”, 3/8” UNC
M8, M10, M12

Set Drills: 1/16” to 1/2”
Wheel socket (FF2000) 1 1/8” (available from Reynard Racing Cars).

14.3 Spherical Joints, Rod Ends and Bearings

Location	Qty	Part No	Bore	Thread
Front lower wishbone/chassis	2	ART6ECR	3/8”	3/8” UNF
Front lower wishbone/chassis	2	ARHT5ER	5/16”	3/8” UNF
Front lower wishbone/upright	2	ARHT8ECR	1/2”	5/8” UNF
Front rocker pivot	2	ABWT8	1/2”	
Front rocker pivot	2	ABT8	1/2”	
Front rocker/upright	2	ABWT10	5/8”	
Rear rocker pivot	2	ABWT8	1/2”	
Rear rocker pivot	2	ABT8	1/2”	
Rear rocker/upright	2	ARHT8ECR	1/2”	5/8” UNF
Rear toe link/inner	2	ARHTL7ECR	7/16”	1/2” UNF LH
Rear toe link/outer	2	ART10ECR	5/8”	5/8” UNF
Rear wishbone/inner	2	ART8ECR	1/2”	1/2” UNF
Rear wishbone/inner	2	ABWT8	1/2”	1/2” UNF
Rear wishbone/outer	2	ABWT10	5/8”	
Front track link/inner	2	ARTHL5ECR	5/16”	3/8” UNF LH
Front track link/outer	2	ART6ECR	3/8”	3/8” UNF
Front ARB Drop link	4	AMR4	1/4”	1/4” UNF
Rear ARB Drop link	4	AMR5	5/16”	5/16” UNF
Gear lever mount	1	AMR6	3/8”	3/8” UNF
Gear linkage guide	2	AMR8	1/2”	1/2” UNF
Clutch rod ball joint	1	84F-07-05		10-32 UNF
Throttle cable	2	AFE3	3/16”	10-32 UNF
Rear ARB cable	1	AFE3	3/16”	10-32 UNF
Wheel bearings	4	SKF633007C		

15.0 Tracking

Before tracking the car from new, after repairing accident damage or replacing any suspension component, always preset the suspension link lengths as per the setting up advice. This will save considerable time. You will be unable to track the car successfully if there is undue play in any moving component, eg. wheel bearings, rose joints. If possible keep a spare set of wheels with the outside rim machined true specifically for tracking. If you are unable to do this ensure that the wheels are undamaged and take readings off the rim, then rotate the wheel half a turn and re-check, taking the average as the true reading.

Pre-tracking Procedure

Before you begin the tracking operation, ensure that you adopt the following procedures:

15.1 Check all the links are preset as per setting up data.
15.2 Ensure the car is mechanically sound, ie. No play in wheel bearings, rose joints.
15.3 Ensure that the wheel rims are true.
15.4 Check that tyre diameters and wear pattern is the same side to side.
15.5 Set tyres to the correct pressures.
15.6 Remove one front and one rear anti-roll bar drop link.
15.7 Check that the spring free lengths are the same side-to-side. If there is a difference, put the long spring on the left hand side of the car and note the difference (up to 2mm is acceptable).
15.8 Check that spring platforms (ie. Damper abutments) are the same side to side. If the springs are slightly different lengths, preset the platforms accordingly, ie. The left hand spring is 2mm longer than the right, preset the left hand abutment 2mm lower.
15.9 If the adjustable dampers are fitted, ensure that they are put on their minimum setting, not forgetting to reset them prior to testing.
15.10 Track car with driver and half-fuel load.
15.11 Track the car on the flattest piece of ground available. Check with a long straight edge and a camber gauge. If the ground is not perfectly flat, place the straight edge and camber guage across the front wheels and pack under one wheel until the gauge reads level. Repeat at the rear. Remember to allow for the depth of packing when measuring ride height.

Tracking Sequence

It is easiest to adjust castor and bump steer with the car up on stands. Ensure that the car is steady on the stands and level. Place a camber gauge across bottom chassis rails for and aft and pack until car is level in both directions.

Ride heights, wheel weights, camber, roll bar preload and toeing are checked with the car on the ground. It is possible to do the complete tracking operation on the ground in the following sequence:

15.12 Complete pre-tracking procedure
15.13 Ride heights
15.14 Wheel weights
15.15 Front castor
15.16 Front camber
15.17 Front bump steer
15.18 Recheck front camber
15.19 Rear camber
15.20 Rear bump steer
15.21 Recheck camber
15.22 Front toe-ins
15.23 Rear toe-ins
15.24 Recheck ride heights
15.25 Recheck cambers
15.26 Reconnect anti-roll bar drop links so that they are not under tension.

Tracking Calibration

As an aid to quick setting up, the following table gives the amount each setting is altered by making a fixed adjustment.

Setting	Adjustment	Alteration
Front caster	1 turn	0.37°
Front camber	1 turn	0.37°
Rear camber	1 turn	0.48°
Front toe-in	1/2 turn	4.4mm
Rear toe-in	1/2 turn	2.0mm
Front ride height	1 turn	2.8mm
Rear ride height	1 turn	2.6mm

16.0 Operational Guidelines

To consistently get the best from your Reynard, it is essential before you test or race, that the car is properly prepared as outlined in this manual. Particular attention should be paid to maintaining the fits and tolerances of all the moving parts of the suspension system. Any undue wear, poorly repaired accident damage, or sloppy maintenance will negate much of the car performance potential and valuable track time would be wasted trying to rectify unnecessary problems.

Regular Workshop Maintenance

16.1 Always clean car thoroughly every time car returns to the workshop. This is a good time to visually check all components for wear or minor accident damage as you clean. After cleaning car (either with jizer or a 50/50 mix of paraffin and petrol) hose clean with water, blow dry with an airline and WD40 all rose joints, suspension links, etc. to prevent rust. Do not WD40 discs but do dry thoroughly.

16.2 Make a job list based on your test or race notes and complete the major items first, ie. Send engine away for rebuilding, repair accident damage, etc. Remember to put the battery on charge.

16.3 Methodically check all nuts and bolts for security.

16.4 Check all moving parts for play, fit, security or damage, eg. rose joings, wishbones, wheel bearings, wheels, brake dics, bellcranks, anti-roll bars, dampers, etc.

16.5 Change gear ratios if necessary and check gearbox oil level and selection after changing ratios.

16.6 Check all systems:

Throttle: full throttle return action and throttle stop.
Clutch: clearance, free play and stop.
Brakes: pressure check for leaks, disc runout, brake balance bar and pushrods for security. Replace brake fluid regularly, particularly after a wet test or race. Lightly clean discs with emery cloth.
Oil/Water: check for leaks, security or chaffing. Check levels.

16.7 Run engine to check oil/water systems and operation of starter motor.

16.8 Check Tracking: camber, castor, toe-in, bumpsteer, ride height, wheelweights, anti-roll bar preload, tyre diameter.

On-circuit Maintenance Checks

Before leaving the pits:

16.9 Check all fluids – oil, water, gearbox and brake fluid.

16.9.1 Warm engine to operating temperature. Blank oil cooler and radiators as necessary.

16.10 Check tyre pressures and diameters.

16.11 Check damper and anti-roll bar settings.

16.12 Check wing settings and ride heights (with driver and fuel).

16.13 Check wheel nuts.

16.14 Complete 3 or 4 laps at moderate speed then pit. Adjust radiator blanking if necessary, check wheels for security. Check tyre pressures and check engine bay for leaks.

16.15 Start testing remembering to monitor fluid levels, tyre pressures and wheel security and ride heights at every pit stop.

16.16 Try and achieve a good handling balance by adjusting anti-roll bar and wings as necessary.

16.17 Any handling imbalance that cannot be cured by simple adjustment will require some detective work to isolate. Before making any changes, always double check that all the basic settings are correct. “Handling Problems” are invariably a direct result of failing to operate or maintain the car properly.