

RACING ON A SHOESTRING

By Steve Chapman
PART SIX OF A SERIES TO
HELP THE BEGINNER

GEARING Continued from June

Only use these figures as a guide, and consult other drivers if you are not happy with your ratios. The best way to settle on a ratio is to carry out some test driving, but with modifications of a tooth either way depending on race performances.

On the move do not attempt to go too quickly too soon. Try to feel the sensitivity of the steering, the throttle and the brake.

When you are able to lap at such a speed that you are using full throttle for more than half the length of each straight, it is time to adjust the carburettor jets. This may be carried out "on the move" with a little practice, but

is only possible if a washer is soldered to the head of the slow running jet.

(a) **HIGH SPEED JET** — After running the motor for a few laps adjust the jet (T) until the engine strokes at the braking point on the longest straight. This will give you a reasonable top speed, without the problems of seizing through insufficient lubrication. You will need to learn to adjust this jet on the move — only move it by about 1/8th of a turn in this case. Practice whilst the kart is standing still by feel and you will see why a good finger guard is very important.

(b) **STROKING** — This occurs when too much fuel is entering the motor, causing the two stroke cycle to cease and a four stroke cycle to commence. The effect is to limit the top speed and cause the motor to gurgle at high revs (or possibly quite low revs if very rich), rather than run clean. An engine that is stroking should not seize through lack of lubrication. Some drivers believe that too much stroking over a long period causes pistons to crack!

(c) **SLOW RUNNING JET** — this is adjusted to give a clean pick up out of slow corners, after the high speed jet has been set. If the jet is set too far in (too weak) the engine will pick up out of a bend and then falter. Too rich and the engine will pull from low revs in a very sluggish fashion. Most carburettors are set to be optimum between 3/4 and 1 1/4 turns from fully in. It is a good idea to learn to alter this jet on the move but it is not quite so important as the high speed jet.

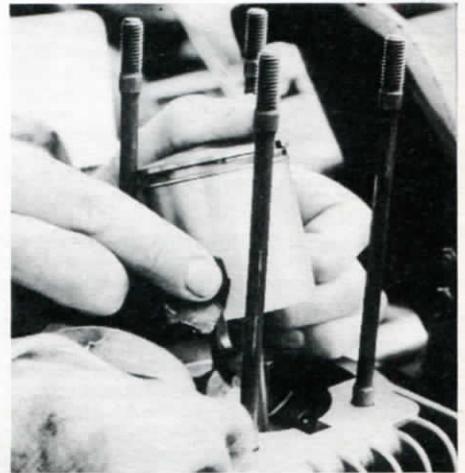
(d) **CHOKING** — You will now know that when starting the motor, choking (richening the mixture) is important. When racing with a very weak mixture it is a good idea to pat the carburettor at

maximum revs; this may prevent a dry seize! At the end of a race do not take your foot off the throttle and coast; this may also cause a seize. Always choke the carburettor as you back off the throttle in this situation.

(e) **JUNIOR FATHERS** — You may choke the engine to help start it! Push on the right hand side of the kart and hold your hand over the carburettor mouth once the engine is turning over; release as it pulls away.

(f) **RUNNING IN** — If you have a new motor or one which has had components replaced, it will require running in.

A new motor should be run in gradually, increasing the revs over a period of at least one hour. Always run by blipping the throttle slowly increasing the time that the throttle is held at maximum. The engine should always stroke at whatever maximum speed you are using.



Rubbing down the piston with wet & dry

SUPER ONE SCORES

(FIGURES IN BRACKETS SHOW POSITION AFTER PREVIOUS ROUND)

100 NATIONAL

POSN	NAME	1	2	3	ROWR	TOTAL
1	(1) G. Moynihan	125	115	100		340
2	(3) R. Grice	90	126	122		338
2	(4) R. Weatherley	113	96	129		338
4	(2) J. Plato	108	116	103		327
5	(18) C. Brown	86	85	120		291
6	(11) J. Cotterill	85	107	86		278
7	(18) D. Connelly	83	88	96		267
8	(9) N. Edwards	105	89	70		264
9	(22) S. Sutton	91	69	102		262
10	(13) A. O'Hara	98	84	73		255
11	(23) S. Banks	105	54	89		248
12	(5) G. Roscoe	121	87	38		246
13	(16) L. Di Resta	102	70	72		244
14	(16) J. Beasley	84	88	72		244
15	(25) S. Sykes	47	104	87		238
16	(27) G. Prior	34	96	107		237
17	(7) S. Tillett	107	89	38		234
18	(6) K. Thorpe	99	99	21		219
19	(29) P. Fletcher	57	66	85		208
20	(20) D. Beasley	80	84	35		199
21	(7) P. Rochford	92	104	0		196
22	(10) D. Higgins	89	104	0		193
23	(26) M. Faulder	51	82	56		189
24	(12) M. Day	93	90	0		183
25	(14) D. Cuff	80	97	0		177
26	(15) L. Cranmer	112	61	0		173
27	(49) S. Dart	27	36	108		171
28	(46) M. Jones	54	25	89		168
29	(20) M. Salter	58	106	0		164
30	(37) D. Scott	50	56	57		163

31	(24) J. Weatherley	112	44	0	156
32	(48) D. Jones	51	23	81	155
33	(45) P. Elliot	69	12	73	154
34	(44) P. McNicol	32	50	67	149
35	(56) B. Wilson	0	51	93	144
36	(51) T. Negal	0	62	80	142
37	(28) R. Chuter	90	38	0	128
38	(39) G. Till	67	28	29	124
39	(41) B. Taunton	52	35	35	122
40	(30) D. Spencer	0	120	0	120
41	(31) C. Wheldon	57	62	0	119
42	(43) N. Hann	15	68	35	118
43	(32) L. Marsden	17	99	0	116
44	(33) P. Wilkes	45	69	0	114
45	(34) S. Brogan	47	63	0	110
46	(35) P. Hunnisett	41	68	0	109
47	(36) J. Earnshaw	56	51	0	107
48	(58) G. Blick	13	22	71	106
49	(38) L. Crane	66	32	0	98
50	(40) S. Richardson	57	36	0	93
51	(64) F. Crankshaw	0	0	90	90
52	(42) G. Waldron	43	43	0	86
53	(47) C. Owen	76	0	0	76
54	(49) M. Parker	40	23	0	63
55	(51) B. Moon	31	31	0	62
56	(53) S. Timperley	38	22	0	60
57	(62) A. Jowett	0	18	40	58
58	(54) M. Gallienne	27	29	0	56
59	(55) V. Young	25	29	0	54
60	(57) C. Laine	16	21	0	37
61	(59) D. Lampitt	24	7	0	31
62	(60) B. Benham	0	26	0	26
63	(61) R. Hartley	0	24	0	24
64	(63) S. Mayo	0	17	0	17

JUNIOR BRITAIN	1	2	3	ROWR	TOTAL
1	(1) A. McNish	130	130	109	369
2	(3) D. Coulthard	105	109	120	334
3	(5) J. Griffiths	104	95	111	310
4	(4) M. Mills	118	92	93	303
5	(2) S. Webb	110	110	76	296
6	(6) M. O'Connell	108	88	99	295

7	(9) N. Hart	74	110	91	275
8	(8) C. Jones	85	100	86	271
9	(10) P. Rees	90	91	63	244
10	(12) M. Kemp	90	68	81	239
11	(12) R. Smith	84	74	77	235
12	(7) S. Nicholson	95	93	46	234
13	(15) J. Worden	71	82	76	229
14	(16) S. Wallace	67	79	79	225
15	(17) P. Ozanne	70	74	79	223
16	(14) M. Jubb	54	102	66	222
17	(20) B. Game	52	84	80	216
18	(19) M. Gellatly	52	90	72	214
19	(18) G. Wood	62	81	64	207
20	(21) S. Davidson	70	59	63	192
21	(22) O. Newman	67	49	71	187
22	(11) R. Wilson	103	72	0	175
23	(24) J. Weller	0	53	78	131
24	(23) M. Payne	22	54	38	114

100 BRITAIN	1	2	3	ROWR	TOTAL
1	(2) A. Clarke	120	109	124	353
2	(1) S. Hazlett	114	117	93	324
3	(3) M. Beddall	116	108	93	317
4	(5) C. Hogben	110	86	109	305
5	(7) J. Thompson	89	98	114	301
6	(4) D. Gibbs	97	104	96	297
7	(6) K. Baines	90	101	51	242
8	(13) M. Hair	75	61	95	231
9	(12) C. O'Hara	78	69	80	227
10	(16) P. Cooke	59	62	93	214
11	(9) D. Smith	83	74	38	195
12	(17) G. Chapman	0	115	77	192
13	(8) M. Powell	93	89	0	182
14	(10) P. Branfield	70	85	0	155
14	(19) P. Walsh	66	0	89	155
16	(18) J. Wilcock	23	57	71	151
17	(11) S. Sparkes	83	65	0	148
18	(20) K. Hudson	59	0	74	133
19	(14) P. Smith	31	95	0	126
20	(15) T. Radford	78	45	0	123
21	(21) C. Judd	10	46	0	56

Use two 10 minute and then 20 minute sessions. Check the piston sides between each session after allowing the motor to cool. You are looking for shiny rub marks which will indicate the high spots on the piston. You have the choice of lightly rubbing these spots down or running in until they clear by themselves (our technique).

After forty minutes start to weaken the high speed jet until the engine strokes less and less on the longest straight. You can drive hard round the bends. Consider the first stage of running in complete after about one hour. The next stage is to push the engine a little harder; until you are able to run with little or no stroking for five minutes, without shiny patches appearing on the piston. If this is not possible more time is required, unless you shorten the running time by rubbing down the shiny "high spots".

Spinning and restarting are all part of kart racing so do not worry if it happens quite often. The saying "If you are not spinning you are not trying!" is a bit harsh but it does give you an idea that it's not a bad thing to do.

When you spin, put your hands high in the air so that other drivers have a better chance of seeing you. As soon as it is safe to do so pull your outfit to the side of the track. The inside of a bend is safer, but it may be quicker to move to the outside, in either case lift your outfit over the track barrier.

To restart, position your kart in the racing direction. Having looked to see that it is safe to start, lift the rear with one hand, the other holding the seat back; run for a few paces and bounce it down firmly. Still pushing hard, listen for the engine so as to be on the throttle as fast as possible. You may need to choke the carburettor slightly. Practice makes perfect, but it's not easy!

ADJUSTING THE HANDLING

The advice on setting up a chassis given in this chapter, is based on our own experience with a number of different types of chassis. Your local expert may suggest totally opposite adjustments with exactly the same effect; try both ideas if one does not work.

Over and Under Steering are the effects which we are trying to control. With a Formula 1 racing car we are told that setting up for slight understeer is the fastest way round a circuit, it is different for most people in karts; but what does over or understeer mean?

(a) **Oversteer** — when cornering the tail of the kart is sliding outwards, whilst the front end follows the desired line.

(b) **Understeer** — when the kart will

not turn in, it runs on as you turn into a bend.

Correcting the handling is carried out by varying the following areas of the outfit:-

(a) The distance between the front or rear wheels; the front and rear track.

(b) The stiffness of the front or rear of the chassis.

(c) The tyre pressure or, where a range of tyres are allowed, the type of tyre.

Test driving is a difficult area for the beginner but in time it may be mastered.

Test driving does not mean spending hour after hour simply driving round a circuit: you learn very little and wear out your equipment! Test driving must follow a strict procedure or the results you obtain may become confused.

Check your outfit and start up. Drive round the track gradually increasing to racing speed (or your own limit) over about two to three laps. Drive at this limit for no more than three laps. This procedure allows time for the tyres to warm and the minimum of time with the driver under pressure. An experienced driver will easily be able to put together a set of useful laps. If you spend longer "flat out" inconsistencies will creep in. We time every lap under these circumstances and save the results for reference. What you are looking for is a set of three laps within a fraction of a second of each other. This is the only way to check a change in performance after a chassis, gearing, or motor adjustment.

Here is an example of a set of times obtained in practice for the 1984 100 Britain, British Championships at Felton.

Motor A	Motor A sprocket Change	Motor B
37.26	38.86	37.14
36.26	37.05	36.25
35.54	36.30	35.83
35.61	36.37	35.80
35.55	36.34	35.83

Adjusting the handling requires a practice session and the help of an assistant to record times.



Monitor & record all lap times

ALL PHOTOS: Dennis Callingham

Check your outfit as described earlier and set off round the circuit. After a lap or so to warm the tyres increase your speed until you are driving near to your limit; what happens to the handling?

If you are experiencing understeer loosen the bolts holding the front bumper and the front of the floor tray. If they are already slack, move the front wheels closer together by 1/2cm each side. Try the modification on the circuit using the test driving procedure. If the understeer has not improved readjust the front track and try the test again. If the front wheels need to be moved in until there is no more adjustment, it is time to move to the rear of the kart. Understeer is created by the rear of the kart gripping too much, pushing the kart on. Moving the front wheels in means the tyres dig in earlier in a turn.



Bouncing the frame "true"

To lose grip at the rear either tighten the rear bumper, or move the rear wheels outwards on the axle. Make adjustments in 1/2cm steps and carry out the test driving procedures again. Repeat the process until the handling is neutral (very rare), or there is only the minimum of oversteer. Be aware that it is not always possible to make a chassis handle well on EVERY bend in a circuit. There will be important bends; usually fast bends, or bends just before a major straight, and bends which are very slow and require a totally different chassis setting. It is not worth setting up the handling for one slow bend as these rarely affect race positions.

If your problem is too little rear end grip, causing the back of the kart to slide, the answer is to reverse the above procedures. Move the wheels further and further in at the rear or further and further out at the front. If this does not work loosen the front or rear bumper bars. Working on the rear end reduces the problem by reducing rear end slide, whilst working on the front end reduces the problem by introducing more understeer to balance the chassis.

With three bearing rear axles, removing the middle bearing allows more chassis flex and less oversteer. With very sticky tyres, too much grip will make the chassis lift its inside wheels; here stiffening the chassis will reduce the problem.