

c.1970 ACTION MAN GO KART INSTRUCTIONS

ACTION MAN GO KART



HISTORICAL

Karting (not Go-Karting) started in America in 1959 when someone had the idea of fitting small engines normally used for lawn-mowers, power tools and saws, etc., on to a small chassis and racing them. This idea very quickly "caught on" in this Country and developments in chassis design, to include brakes and car type steering, were made to accommodate the high revving, highly reliable simple two stroke motor cycle type engine.

Kart racing is divided into two main classes, one class of racing machines using an engine of up to 100 c.c., without any form of gearbox, i.e. a direct drive from the engine sprocket to the rear wheels, and the other class using engines of up to 250 c.c., but with variable transmission, i.e. a clutch and gearbox and controls like the motor car.

THE KART MAKERS

The major manufacturers are the firms of Blow, Zip, Barlotti, Aero, Dale and Deavinson. Additional components such as wheels, tyres, petrol tanks, seats, steering and number plates are available from many sources and the choice is left largely to the competitor. The engines are all two-stroke primarily designed for motor-cycles due to their reliability, price, small number of moving parts (there is no valve gear such as separate inlet and exhaust valves, push rods, timing chains etc.) and their capacity for producing lots of R.P.M. A useful comparison can be made here to indicate why present-day karts in the 250 c.c. International Class have better performance than some high powered sports cars. The Jaguar Mark X develops about 210 brake horse power and pushes along a car of about 30 cwt., this indicates a power of about 7 B.H.P. per cwt. A 250 c.c.



DRIVER'S GEAR

Racing Regulations state that all drivers must wear:

- (1) Crash Helmet to B.S. Standards, this can cost between £5 - £30, usually made from toughened fibreglass and heavily padded.
 - (2) Goggles or eye protection in the form of specially designed face screen attached to the Helmet. Cost between 10/- and £4.
 - (3) Protective clothing. Usually will consist of single or two piece specially cut leather or heavy duty P.V.C. coated fabric in the form of overalls, padded at elbows, knees and shoulders. Cost between £6 and £30.
 - (4) Driving gloves with full protection to back of hands - Cost £1 - £4.
 - (5) Lightweight driving shoes or boots - baseball type "pumps" often used to allow maximum "feel" of the controls. Cost £1 - £8.
- Many drivers also carry lightweight proofed nylon waterproofs to fit over the racing overalls during wet weather driving - cost £2 - £6.

Bultaco will develop about 35 B.H.P. to push a Kart and driver of about 3j cwt., giving a power of about 10 B.H.P. per cwt. It is understandable therefore why karts can invariably show their heels to some of their "bigger and better" brothers.

The main engine manufacturers are Parilla, Saetta, Guazzoni, Komet and Montesa in the "up to 100 c.c." class, and Villiers, Montesa, Suzuki, Ossa and Bultaco in the "up to 250 c.c." class.

The Governing body of all motor racing sports is the R.A.C. from whom Permits must be obtained before any racing can take place. The specifications for the machines are numerous but the main ones say that the maximum length of the kart is 6 feet, and the maximum width about 4 feet, with specific measurements for wheel base, track and height. Other details include special specifications for brakes, seats, controls, petrol tanks, ignition systems, fuels and oils, chain guards and number plates. Particularly important are the minimum weight levels of

kart plus driver, this ensures that the small slim lightweight driver does not have an unfair advantage over the "big" man and whenever necessary some form of additional weighting - usually rolls of lead - must be securely attached to the frame to give the minimum weight required in each class.

The class weights are 240 lb for Juniors, 264 lb for Class I and 350 lb for Class IV.

NOTE: Classes are included in 1 (b).

THE CIRCUIT

A good kart circuit will have a smooth tarmac/adam surface that does not hold the rain and it should have adequate facilities for spectators, both for viewing and car parking. It should not be too long nor too wide, and there should be open fast corners as well as tight slow hairpins.

A good typical circuit suitable for all classes of Karting would be about 1,200 yards long, 10 yards wide, containing two fast straights of about 150 yards each with a number of slow and fast corners suitably placed. Many airfield layouts can have this type of circuit built in for periodic meetings but being of a temporary nature the associated problems of temporary barriers and safety fencing can be rather large. Permanent circuits such as the ones at Heysham Head, near Morecambe, Felton near Mopeth, Rye House near London, have been designed for Karting and contain all the refinements for first class racing coupled with facilities for spectators and drivers alike.

Car racing circuits such as Cadwell, Oulton Park, Silverstone and Brands Hatch provide all these facilities but only the characteristics of short twisting tracks show the handling and performance of the smaller classes to the full. The big engine 200 c.c. and 250 c.c. drivers of course, enjoy large circuit racing, where the maximum performance of their vehicles can be used and speeds of 130 m.p.h. along the straight sections are not uncommon.

KART DRIVING

Kart driving is unlike any other form of racing and should not be compared with cars or motor cycles. Whilst steering, brakes and engines all perform similar duties, driving techniques can be vastly different. This is due largely to the rear wheels being fixed on a common back axle, so that during cornering both rear wheels travel at the same speed without the benefit of a differential unit. Obviously then skidding and drifting becomes an essential part of the kart driver's technique. Due also to the design of the engine and the gearing ratios employed, the maximum performance is obtained at high engine speed, and R.P.M. of over 10,000 is exceeded by many of today's racing engines, it is necessary therefore for the driver to ensure that his engine runs at high revs at all times, and this technique, without causing internal engine failure, needs much practice.

250 c.c. WORLD CHAMPIONSHIP

Consider then the Final of the 1969 World Cup Race for Class IV 250 c.c. International machines - the fastest of all - as told by the Driver who won this magnificent trophy in 1968:

"This is the most magnificent Kart Race in the World and having won at Heysham Head last year, I had to make sure of winning again, just to let everyone in the 10,000 crowd see that it wasn't a fluke last time. Apart from the fact that the Gold World Cup looks well on our display cabinet, the £100 cash prize, plus all the photographs, and publicity is very nice as well.

My Zip Bultaco had performed reasonably well during the heats and I eventually found myself on the second row from the front when the starter's flag dropped. The tension waiting for the flag to drop was unbelievable, 31 karts in addition to mine, all capable of over 120 m.p.h., all grouped closely together, all drivers watching the starter like a hawk, 32 engines all in bottom gear, clutch held in, engines revving like mad, fantastic noise, smoke from the exhaust of the karts in front, creeping slightly forward, ease off the throttle and down goes the flag.

32 karts all away and into the first bend, inches only separating the front four and less than 10 yards between first and last man, into second gear, flat out, into third, into fourth and I'm at the steep right hand top bend travelling at about 60 m.p.h. less than 10 seconds from the start and climbing round a 1 in 5 gradient, feels like the Wall of Death, one kart spins out on to the grass, three in front - must catch up. Flat out in fourth and now the fast down hill run to the hairpin, 5th gear, 110 m.p.h. and only 30 yards to the hairpin, down to fourth, then third, then second, brakes hard on, correct the slight skid, down to bottom, slip the clutch, keep the revs up, drift round to the right, two only now in front, straighten out, flat out in bottom past the start, second, third, fourth, hold in fourth back into the Wall of Death, still two in front and twenty odd more laps of this.

After 23 laps without any major problems, apart from one driver missing a gear, over revving his engine and seizing solid alongside me, another with a burst tyre overturning on the hairpin - no injuries - two drivers colliding and finishing up on the grass laughing at each other, Kart Number Zero (the only one in the Country allowed to carry this number to show the winner of the World Cup) is in the lead. Two laps to go, will the brakes fade after such tremendous punishment, shall I have a puncture at the last moment, have I sufficient petrol, did Alan - my mechanic - remember to top up after the heats, will that fool get in my way again after having been passed once before, have I miscounted the laps, no time to worry, out of the hairpin down to the start again.

The starter thumbs up, last lap board out, only another half mile, flat out in second, third, airborne with all four wheels, fourth, hold it, stop it drifting too far out - the

crowd waving programmes - into fifth, final 100 mile an hour plunge to the hairpin, please, please, please, smoke from front tyres, braking too hard, too fast, brake again, easy, drift gently, not too close to the straw bales, toe down, first, second and the chequered flag just misses my head, gently into third, fourth and back down the hill, crowds laughing, cheering, flags and programmes waving, collect the flag, cruise round, lap of honour, wreaths round my neck, into the paddock, Gold Cup, Champagne, father saying not bad - nearly made a mess of it on lap sixteen - but secretly proud, lifted literally out of our faithful Zero - all over for today, the worst part will be the official presentation tonight."

Graham G. Liddle

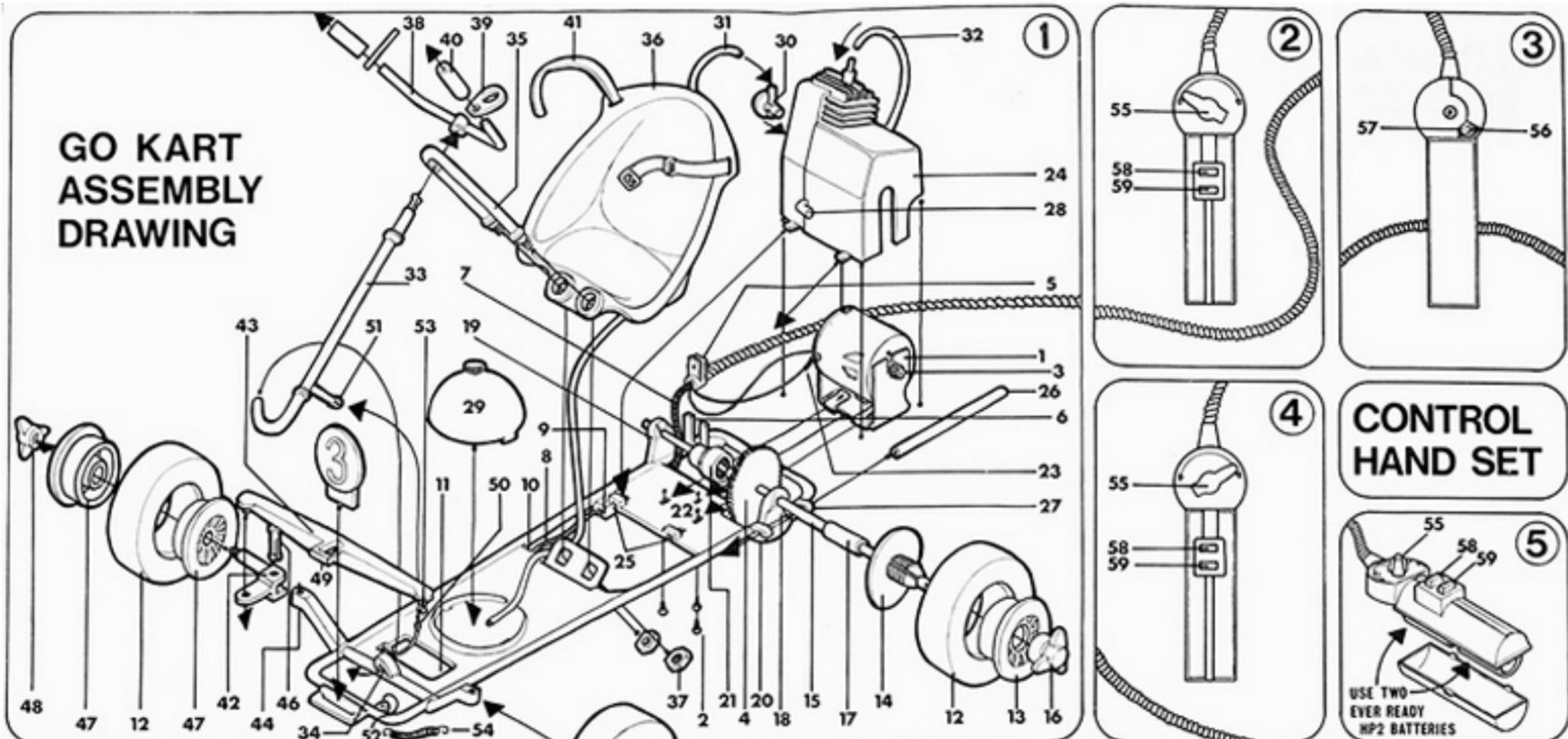
G. G. LIDDLE
(Known as GEE)

Winner of the World Cup 1968
Winner of the World Cup 1969
Driving a Zip frame, with a 5 speed 250 c.c. Bultaco engine specially race tuned by Ken Norton.

Class	Plate Colour	Number Colour
Juniors	Blue	White
Class I	Green	White
Class I Super	Yellow	Black
Class IV	Green	White
Class IV Super	Red	White
Class IV International	Yellow	Black



ACTION MAN GO KART ASSEMBLY



GO KART ASSEMBLY DRAWING

FIRST STAGE: CHASSIS, ENGINE & TRANSMISSION

1. MOTOR IN METAL BRACKET
2. THREE SCREWS
3. DRIVING COG
4. GEAR WHEEL
5. CONTROL LINE ANCHOR PIECE
6. ANCHOR PIECE BRACKET
7. SPRING CABLE
8. STEERING LINE
9. CABLE BOX
10. STEERING LINE CHANNEL
11. FRONT RECTANGULAR HOLE

12. TYRE
13. REAR WHEEL HUB
14. REAR INNER WHEEL HUB
15. AXLE
16. REAR WING NUT
17. SPACER
18. NEAR SIDE CHASSIS BEARING
19. OFFSIDE CHASSIS BEARING
20. GEAR WHEEL WELL
21. COLLET
22. OVAL HOLES FOR SCREWS
23. MOTOR CONTACTS

SECOND STAGE: PETROL FEED, IGNITION & EXHAUST

24. ENGINE HOUSING
25. ENGINE HOUSING BRACKETS
26. EXHAUST PIPE
27. EXHAUST PIPE BRACKETS
28. EXHAUST PIPE PIP
29. PETROL TANK
30. CARBURETTOR
31. PETROL FEED PIPE
32. SPARKING PLUG LEAD

THIRD STAGE: STEERING COLUMN ASSEMBLY

33. STEERING COLUMN
34. STEERING COLUMN BEARING
35. STEERING COLUMN SUPPORT
36. SEAT
37. NUTS
38. STEERING HORN
39. WRIST STRAPS
40. HAND GRIPS
41. SEAT BELT

FOURTH STAGE: FRONT AXLE AND STEERING CHECK

42. STUB AXLE
43. TRACK ROD
44. STUB AXLE BRACKETS
45. NUMBER PLATE
46. KING PINS
47. FRONT WHEEL HUB
48. FRONT WING NUTS
49. TRACK ROD CENTRE BEARING
50. METAL TAG
51. NESTING HOLE

FIFTH STAGE: ADJUSTING THE STEERING

52. ANCHOR HOLE FOR SPRING
53. TRACK ROD PIP FOR SPRING
54. SPRING
55. STEERING CONTROL KNOB
56. ADJUSTING SCREW
57. SCREW HOLDER
58. FORWARD MOTION BUTTON
59. REVERSE MOTION BUTTON

You will find this Go Kart easy to assemble if you follow these simple instructions carefully, stage by stage, and do not try to hurry the job. Like the building of a real kart, this one takes patience.

Lay out, carefully, all the parts that go to make up your kart on a table or flat surface. Study each part carefully and get to know its name from the diagram. The small spanner provided has a screwdriver blade on the end of its handle. You will need two H.P.2 batteries which are not included in the set.

FIRST STAGE: CHASSIS, ENGINE & TRANSMISSION

1. Begin by placing the chassis in front of you face up (circle shape visible) with the narrower (front) end nearest your left hand. Unless told otherwise, always return the kart to this position after each operation.
2. Take the electric motor (1) which is connected to the handset controls and, with the electric leads on the far side, position the holes in the metal motor bracket over the three oval holes (22) in the rear of the chassis.
3. Then using screws (2), which are in the small polythene bag, screw upwards from underneath the chassis, tightening just enough to hold the engine only loosely in position at this stage.
4. Place the control line anchor piece (5) which is on the spring cable, flat edge uppermost into the bracket (6) on the chassis.
5. Feed the spring cable (7) and the nylon steering line (8) straight down beneath the engine mounting on the chassis. The cable should fit into the little box (9) on the underside, and the steering line should pass through the box and on through the guide channel (10) to the front end of the chassis where it can be left for the moment.
6. Take a tyre (12) and a rear wheel hub (13). Check it's a hub with a larger hole in the centre. Push the hub into the tyre. Fit an inner hub (14) into the other side of the tyre and push them together.
7. Slide the assembled wheel on to one end of the axle (15), inner hub first, until 1" of the axle shows through the threaded end.
8. Screw a large wing nut (16) into the centre of the wheel and tighten it up, using the spanner to help you.
9. Push a spacer (17) on to the axle, tight up against the inner hub.
10. Locate the large gear wheel (4), flat side towards you, in the chassis well (20).
11. Then push the axle through the rear chassis bearing (18) nearest to you, and then through the gear wheel.
12. Then slide on the large collet nut (21).
13. Leave them loose and push the axle through the far bearing (19).
14. Push the nearest wheel assembly firmly against the

15. Now position the engine so that its driving cog (3) mates with the gear wheel and then fully tighten the engine mounting screws with your screwdriver.
16. Then assemble the far side wheel assembly in the same way as you did the near one. Remember to put the spacer on first.
17. Check that the electric motor contacts do not touch the metal engine bracket.
18. Then snap open the hand control set and insert two H.P.2 batteries. Make sure they are the correct way round.
19. Press the forward then reverse buttons to check the free running of the engine and transmission unit.

SECOND STAGE: PETROL FEED, IGNITION & EXHAUST

1. Position the engine housing (24). This clips into brackets (25) in front of the engine mounting bracket and under the chassis bracket to the rear of the control line anchor piece retaining bracket.
2. Push the exhaust pipe (26), which is the fattest of the black pipes, into brackets (27) on the rear side of the chassis, and push the front end on to the point (28) on the front of the engine housing.
3. Clip the petrol tank (29) into the circle on the chassis, trapping one end of the petrol feed pipe (31), which is the longer of the two thin black tubes, into the short groove on the petrol tank.
4. Place the carburettor (30) into the hole on the far side of the engine housing. Then connect the free end of the petrol feed pipe to it.
5. The sparking plug lead (32) can be mounted from the "pip" on the top of the engine housing to the "pip" on the back of it.

THIRD STAGE: STEERING COLUMN ASSEMBLY

1. Thread the curved hook on the front end of the steering column (33) through the round topped bearing (34) in the centre of the front end of the chassis.
2. Note that the petrol pipe feed should be placed to the far side of the steering column support and under the seat during the next operations.
3. Now place the seat (36) over the large hole in the chassis in front of the engine housing, locating the two round holes above the two square holes in the chassis.
4. Push the two threaded ends of the steering column support (35) through the holes in the seat and the chassis.
5. Then push the free end of the steering column right through the hole in the top of the steering column support.
6. Hold all these items in position while you turn the chassis upside down and attach the two nuts (37) on to the threaded ends of the steering column

- support which are now protruding through the chassis under the seat. Tighten them with your spanner.
7. Press the steering horn (38), with the handles at either end sticking upwards, on to the top end of the steering column.
8. Then on to the handles press the wrist straps (39), through their small holes, and on top of them the hand grips (40).
9. Then thread the seat belt (41) through the slots on the seat.

FOURTH STAGE: FRONT AXLE & STEERING CHECK

1. Fix the stub axles (42) to the raised mounting brackets (44) on each side of the chassis, using king pins (46). When positioned, the threaded section of the stub axle should stick out to the sides from the chassis, with the arms carrying the holes being on the lower part of the axle and pointing to the front.
2. Position the track rod (43) with the square box (49) facing forwards, locating the curved hook of the steering column up through it, and pressing the split pins on each end down into the holes on the stub axles.
3. Then assemble the two front wheels. Press the hubs (47) into each side of the tyres, slide both wheel assemblies on to the stub axles, and fix by screwing on the wing nuts (48).
4. Now turn the kart completely upside down.
5. Make sure that the cable spring is hand up against the stop in the box (9) and the nylon steering line passes along the groove (10) and out through the rectangular hole (11).
6. Slip the steering line through the slot in the bottom of the steering column so that the metal tag (50) fits into the hole (51).
7. Now hook the spring (54) between the hole on the chassis (52) and the long pip (53) on the track rod.
8. Turn the kart the right way up and position it so that you are behind the engine with the Go Kart pointing away from you.
9. Now you must take the hand control set and test the steering.
10. In the normal position the control knob (55) and wheels should point to the right. Move the knob to the left and the wheels should move to the left also. Try this while driving the kart forwards and backwards. If the kart does not steer evenly you must adjust the steering line, as explained below:

FIFTH STAGE: ADJUSTING THE STEERING (IF REQUIRED)

1. First look carefully at diagram 2, 3 and 4.
2. Now turn the control knob (55) over into the extreme left position, and hold it there while tuning the handset over.

3. Then with the screwdriver, press down on the white nylon screw (56) in order to release it from its holder (57), and turn it clockwise, a quarter of a turn at a time, until the wheels point to the left. At each quarter, if you release the pressure on the screwdriver, the screw should pop back into its holder and remain firm.
4. If this is so you may now release the control knob and the wheels should be pulled back to the right by the spring. If it doesn't, slacken the screw a quarter of a turn. Finally, not forgetting to put the number plate into the slot in the front of the chassis, you may dress your Action Man in his racing outfit. Strap him into his seat and slip his hands into the wrist straps, then he is ready to race. Have fun!



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