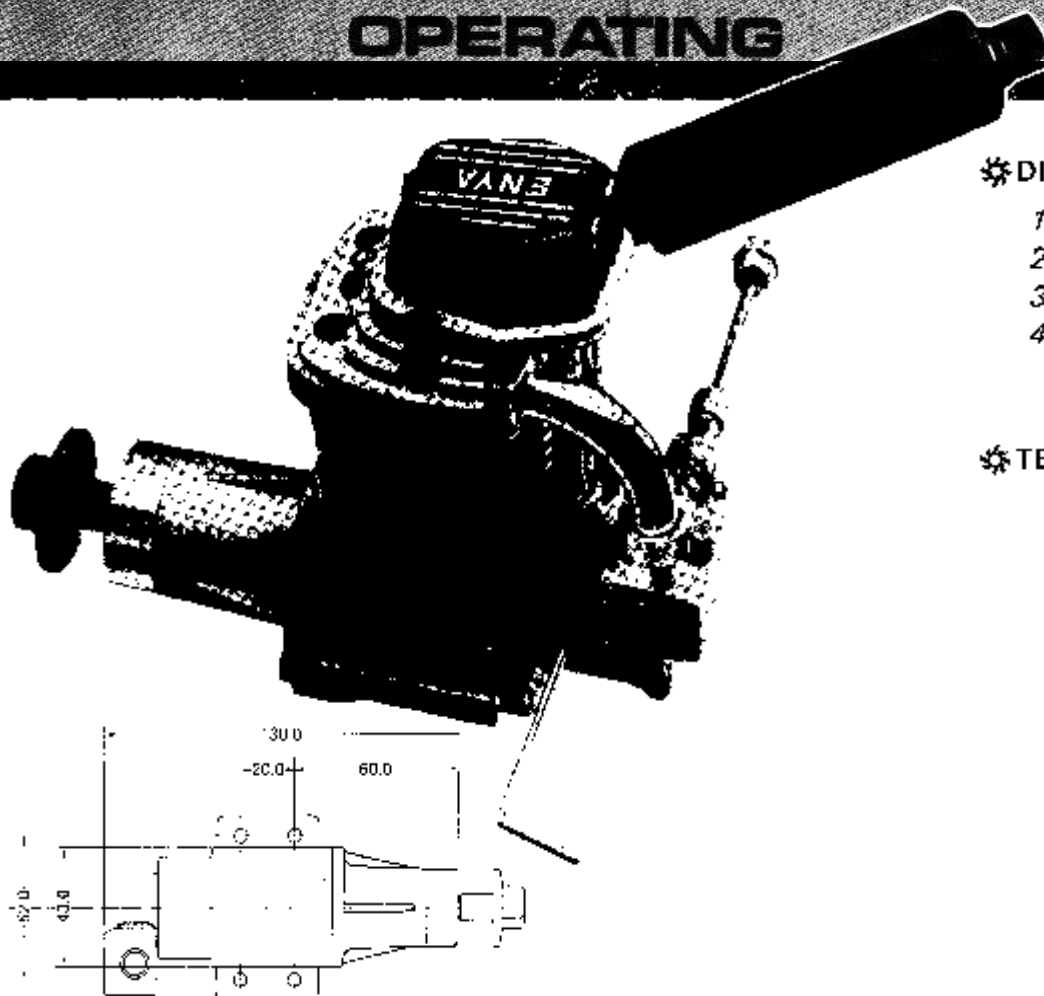


# ENYA

# 90-4C (Ring) 4 stroke cycle engine

## OPERATING

## INSTRUCTION



### ✳DISTINCTIVE FEATURES

1. Suitable for model R/C scale, sport and aerobatic planes
2. High torque and power, nice speed controlling
3. Sturdy and dependable construction
4. Easy handling

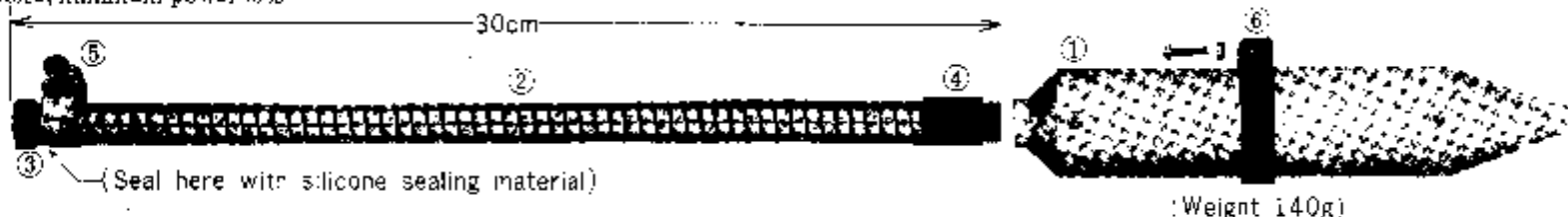
### ✳TECHNICAL DATA

✳Type: 4 stroke cycle, glow plug ignition, with overhead valves driven by push rods and twin camshafts.

ENYA 90-4C		
Cylinder bore x stroke	mm	29.0 x 22.6
Cylinder displacement	cc	14.93
Weight	g	795 (815 with muffler)
Max. power	EIP	1.3/11,500 r.p.m.
Practical speed range	r.p.m.	7,000 ~ 11,500
Idling speed	r.p.m.	2,500 ~ 3,000
Critical speed	r.p.m.	12,500
Carburetor	ENYA G type 8.0mm with detachable 7.0mm venturi	
Cylinder liner and piston	steel liner, ringed Al. piston	
Size of propeller	in.	16~14x6, 13~11.5x7~9
Glow plug	ENYA No. 3, No. 4	
Suitable weight of plane	kg	3.5 ~ 6.5

### ✳OPTIONAL SPECIAL MUFFLER WITH FLEXIBLE TUBE

Soft noise, minimum power loss



### ✳SPECIAL ATTENTION

1. In general, model engine is very powerful and runs at very high speed. Never handle it carelessly. "Safety first" is most important in all respects when you run model engine.
2. Before you run your engine, take care of the following points.
  - Tighten the engine mounting screws and propeller nut once again.
  - Make sure that there are nobody near around (except your assistant).
  - When you fly your plane, or run your boat, it is most important to confirm that your radio control equipment works well. If you find a defective point on it, stop to fly your plane, and repair it perfectly.

### ✳FUEL

To obtain good results with ENYA 90-4C, it is recommended to use high quality fuel for glow plug engine which contains 5 ~ 15% of nitromethane.

STANDARD VOLUMETRIC RATIO OF FUEL COMPONENTS	
Castor oil or high quality synthetic oil	75 ~ 20%
Nitro-methane	5 ~ 15%
Methyl-alcohol	80 ~ 65%

### ✳GLOW PLUG

ENYA glow plug No. 3 and No. 4 is the best for 90-4C.

### ✳PROPELLER

At first choose a well balanced 15 x 6 or 13 x 7 propeller of high quality for your 90-4C. You can get smooth running and good idling with the propellers made of glassfibre as they perform as an adequate fly-wheel. When you use a wooden propeller of rather light weight, it is recommended to use a spinner as fly-wheel. It is important to screw up the prop. nut tightly.

### ✳FUEL TANK

The fuel consumption is about 20 ~ 25cc per minute. Then, about 360cc fuel tank is recommended for usual flight. To make the engine start easy, set the fuel tank at nearly same level as the carburetor.

### ✳PREPARATIONS BEFORE STARTING

1. Connect a piece of vinyl pipe of about 10 cm length on the breather-nipple, to lead the excess oil in the crank-case out of the fuselage.

### ✳STARTING AND RUNNING

1. Fill the fuel tank with fuel, and open the throttle valve fully, and needle valve 6 ~ 7 turns. Then, close the choke valve and turn the propeller counter-clockwise 2 ~ 3 turns until a small amount of fuel is sucked into the cylinder. After priming, open the choke valve again. Another method of priming is to inject several drops of fuel into the muffler and turn the propeller clockwise 2 ~ 3 turns.
2. After priming the engine, flip the propeller 2 ~ 3 turns and be sure that the priming is normal. When the priming quantity is too much, the compression becomes very high, and you cannot start the engine. In such case, turn the propeller counter-clockwise slowly until the excess fuel leaks out of the combustion chamber and the compression becomes normal.
3. Connect the battery to glow plug and flip the propeller counter-clockwise smartly at the compression stroke. In case of 4 stroke cycle model engine, the clockwise flipping is also very effective for starting. It is recommended to try the both methods.
- When the priming and other conditions are proper, the engine starts easily.
4. After your engine starts, open the throttle valve fully, and adjust the needle valve slowly to the best running position. But it is very important to run the engine always with a slightly rich mixture to get the best performance.
5. Close the throttle valve slowly and check the idling. The reasonable idling speed of 90-4C is 2,700 ~ 3,000 r.p.m. Usually, 90-4C prefers rather rich mixture at idling. Control the idling mixture with the idling mixture adjusting screw. When you want richer mixture, close this screw 1/2 or 1 turn at one time, seeing the result, carefully.
6. Try hi-to and lo-to operation several times, and make sure that the engine has no tendency to stop.
7. In the medium speed range between full throttle and idling, the engine runs steadily with the slightly rich mixture fed by the G type carburetor.
8. You can start ENYA 90-4C most easily by an electric starter. But, do not use it when the engine is over primed.

(Continued to next page)

## \* BREAK IN

Break in your 90-4C about 1/2 hour. During this period the engine running is sometimes unsmooth and unsteady. But as you continue the breaking in, the engine running will become smoother and more powerful. Usually, it will take 1 ~ 2 hours for the engine to reach its peak in power and smoothness.

## \* ADJUSTMENT OF THE VALVE CLEARANCES

The normal valve clearances of ENYA 90-4C are 0.05 ~ 0.10 mm when the engine is cold. It is recommended to make the first adjustment of valve clearances after first 1/2 ~ 1 hour of running with the special wrench and driver enclosed in the box. And it is also recommended to check the clearances sometimes after every 2 ~ 3 hours of running. It is important that the adjustment is to be made when the engine is cold. (The valve clearances become wider when the engine is hot because of the expansion of cylinder block.)

## \* MATTERS THAT DEMANDS SPECIAL ATTENTION

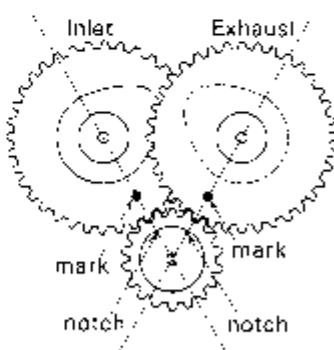
1. The disassembling and assembling of ENYA 90-4C is not so difficult. But do it carefully.
2. When you assemble the timing gear box, put the piston at the top dead center, and then combine the notches of gear shafts and the marks of cam shafts as shown in the sketch.

The standard timing of valves are as follows.

Inlet valve open	20° B.T.D.C.
" close	60° A.B.D.C.
Exhaust valve open	60° B.B.D.C.
" close	20° A.T.D.C.

3. When you assemble the engine, proper lubrications on all the parts are recommended.

The following figure shows the correct positions of timing gears when the piston is at the top dead center.



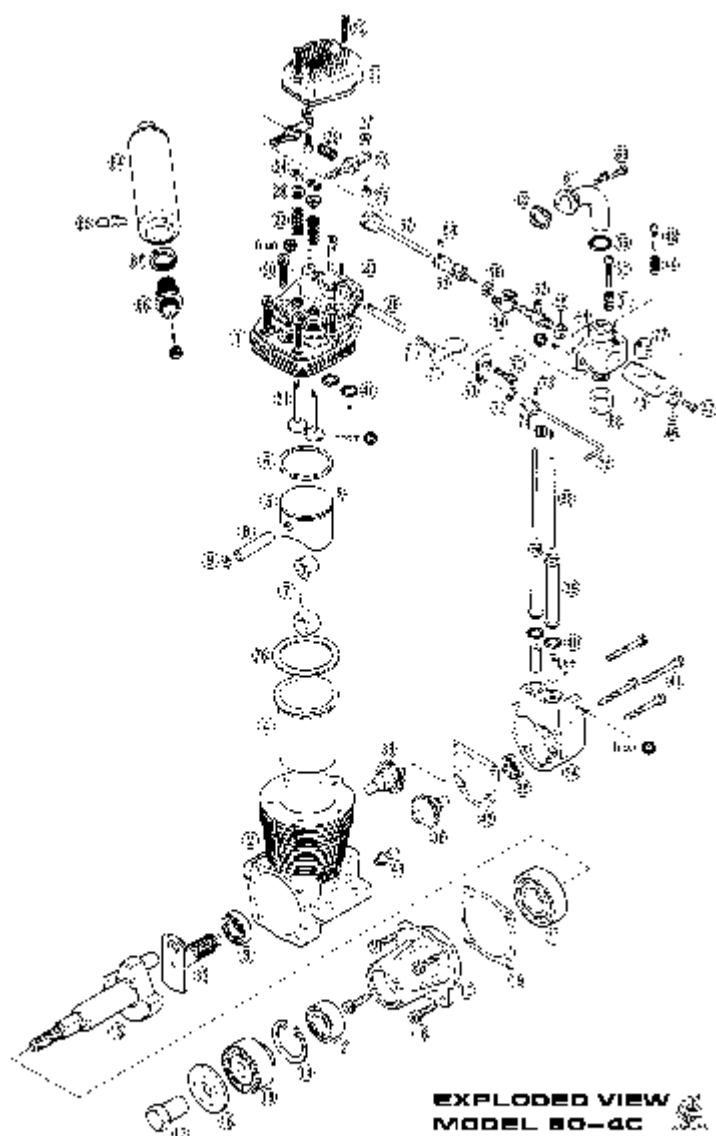
## \* CYLINDER HEAD GASKET AND VENTURI INSERT

In case you need higher power for your aerobatic or pattern plane, it is recommended to detach the aluminum cylinder head gasket and the venturi insert in the throttle valve. You will be able to get about 11% more power at the higher r.p.m. range of 10,000 ~ 11,500 with a smaller size propeller. (13"x7", 12"x8" etc.). In this case, the fuel containing 10 ~ 20% nitro-methane is very effective and usually it is needless to pressurize the fuel tank.

## \* MAINTENANCE

1. Supply a small amount of oil sometimes around the valves and lockers.
2. Do not screw up the cylinder head of 90-4C too tightly to avoid the deformation of cylinder liner.
3. It is usually needless to supply any oil to the inner mechanism, because the oil contained in fuel lubricates all of the inner parts.

## \* DRAWING OF DETAILS \*



EXPLODED VIEW  
MODEL 90-4C

## \* PARTS LIST \*

No. in drawing	Name of part	Qty.	Part No.
1	Cylinder head	1	904C01
2	Crank case (with ball bearing)	1 set	904C03
3	Crank case	1	904C03A
4	Ball bearing	1	11CXU3B
5	Cylinder liner & piston assembly	1 set	904C04
6	Cylinder liner	1	904C04A
7	Piston	1	904C04B
8	Piston ring	1	904C04C
9	Connecting rod	1	904C05
10	Piston pin	1	904C06
11	Piston pin stop ring	2	60X61
12	Front housing (with ball bearings)	1 set	904C07
13	Front housing	1	904C07A
14	Ball bearing A	1	904C07B
15	Ball bearing B	1	604C07C
16	Crank shaft	1	904C08
17	Ball bearing retaining C ring	1	604C62
18	Drive washer	1	904C10
19	Propeller washer	1	904C12
20	Propeller nut	1	904C14
21	Front housing setting screw (4x14)	4	60X15C
22	Gasket of front housing	1	60X16
23	Cylinder head setting screw (4x18)	5	904C15A
24	Inlet & exhaust valve	2	904C17
25	Valve spring	2	904C17
26	Valve spring washer	2	904C17
27	Valve cotter	4	354C14
28	Valve locker arm	2	904C15
29	Valve locker screw	2	354C16
30	Valve locker screw locking nut	2	354C17
31	Locker shaft	1	904C18
32	Locker arm spacing spring	1	904C19
33	Locker shaft setting hollow screw (3x5)	2	904C63
34	Cylinder head cover	1	904C65
35	Cylinder head cover setting screw (2.6x1.5)	2	904C66
36	Timing gear shaft	1	904C81
37	Timing gear box (with ball bearing)	1 set	904C82
38	Timing gear box	1	904C82A
39	Gear box bearing	1	904C82B
40	Inlet & exhaust cam shaft	2	904C84
41	Tapet	2	604C86
42	Push rod	2	904C87
43	Push rod tube	2	604C88
44	O ring for push rod tube (P-6)	4	354C40M
45	Gear box setting screw (3x25)	4	904C89
46	Gasket of gear box	1	904C90
47	Breathing nipple	1	634C92
48	Carburetor assembly	1 set	904C40
49	Carburetor body	1	904C40A
50	Throttle valve	1	904C40B
51	Throttle lever	1	354C40C
52	Throttle lever setting screw (3x12)	1	45B15A
53	Idling speed adjusting screw	1	19X40H
54	Spring	1	60330I
55	Idling mixture adjusting screw (3x17)	1	604C40J
56	Spring	1	60230K
57	Needle valve assembly	1 set	904C40F
58	Spray bar	1	904C40F2
59	Needle	1	604C40F1
60	Needle stop spring	1	15220C
61	Spray bar locking nut	1	29410F4
62	4mm nut	1	09230F5
63	Needle extension	1	904C69
64	Needle extension setting screw (3x3)	1	604C63
65	O ring (P-9)	1	904C40M
66	Carburetor setting screw (3x12)	1	21CX15AC
67	Inlet manifold	1	904C41
68	Gasket of inlet manifold	1	904C42
69	Inlet manifold setting screw (2.6x6)	2	11CX15A
70	Exhaust muffler unit	1 set	M904C
71	Muffler body	1	904C95
72	Pressure nipple	1	093W03C
73	Muffler adapter	1	904C45
74	Locking nut	1	904C46
75	Choke valve assembly	1 set	
76	Lip seal	1	904C93
77	Choke valve stay	1	604C94
78	Choke valve	1	604C95
79	Choke valve setting screw (2.6x6)	1	11CX15A
80	Spring washer 4mm	1	60X30LA
81	Choke lever setting screw (3x3)	1	604C63
82	Choke valve hinge pin	1	604C96
83	Choke lever	1	904C97
84	Gasket of cylinder head	1	904C99
85	Venturi insert (7.0mmφ)	1	904C40L

### OPTIONAL SPECIAL MUFFLER

Photo.	Special muffler assembly	Qty.	Part No.
1	Special muffler body	1	904C47
2	Flexible tube unit	1 set	904C48
3	Flexible tube	1	904C48A
4	Joint to engine	1	904C48B
5	Joint to muffler body	1	904C48C
6	Flexible tube clamp	1	904C48D
	Muffler body setting band	1	TM19D1
	Screw	1	TM19D2
	Nut	1	TM19D3