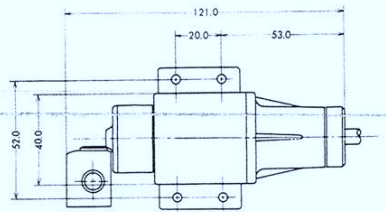
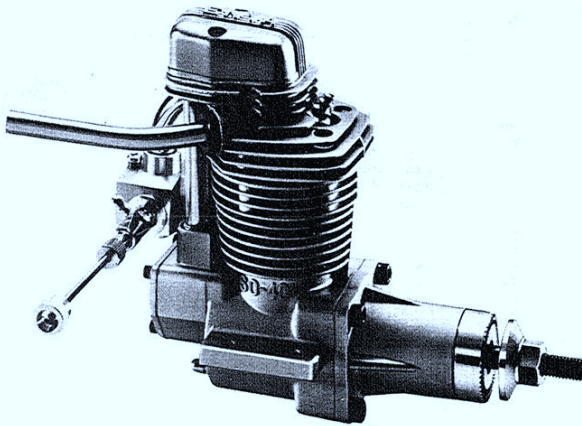


ENYA

60-4C (Ring)

4 stroke cycle engine

OPERATING INSTRUCTION



✿ DISTINCTIVE FEATURES

1. Suitable for model R/C scale and sport 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 60-4C
Cylinder bore x stroke	mm	24.0 x 22.0
Cylinder displacement	cc	9.95
Weight	g	595
Max. power	HP	0.9/11,500 r.p.m.
Practical speed range	r.p.m.	7,000 ~ 11,500
Idling speed	r.p.m.	2,700 ~ 3,000
Critical speed	r.p.m.	13,000
Carburetor		ENYA G type 5.7mm
Cylinder liner and piston		steel liner, ringed AL piston
Size of propeller	in.	16x4, 14x6, 13x6, 12x6, 11x8
Glow plug		ENYA No.3
Suitable weight of plane	kg	2.5 ~ 4.5

✿ 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.
 - o Tighten the engine mounting screws and propeller nut once again.
 - o Make sure that there are nobody near around (except your assistant).
 - o 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 60-4C, 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	18 ~ 20%
Nitro-methane	5 ~ 15%
Methyl-alcohol	77 ~ 65%

✿ GLOW PLUG

ENYA glow plug No. 3 is the best for 60-4C.

✿ PROPELLER

At first choose a well balanced 14" x 6" or 13" x 6" propeller of high quality for your 60-4C. 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 15 ~ 20cc per minute. Then, about 300cc 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.

2. Attach the exhaust pipe, and set the engine on the test stand or plane securely.
3. Set the glow plug and propeller tightly. Choose the best setting angle of propeller at the compression stroke to flip it with your finger.

✿ STARTING AND RUNNING

1. Fill the fuel tank with fuel, and open the throttle valve fully, and needle valve 3 ~ 4 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 exhaust pipe 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. It is recommended to run the engine with a slightly rich mixture while it is new and not broken in.
5. Close the throttle valve slowly and check the idling. The reasonable idling speed of 60-4C is 2,700 ~ 3,000 r.p.m.. Usually, 60-4C 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-lo and lo-hi 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 60-4C 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 60-4C 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 60-4C 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

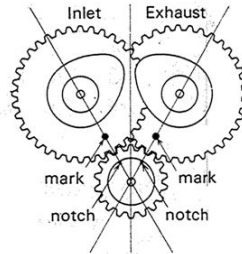
1. The disassembling and assembling of ENYA 60-4C is not so difficult. But do it carefully.
2. They have inlet and exhaust cam-shafts of different shape. (See the drawing of details). Then, when you disassemble the timing gear box, it is important to remember the right positions of each cam shaft.
3. 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.

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

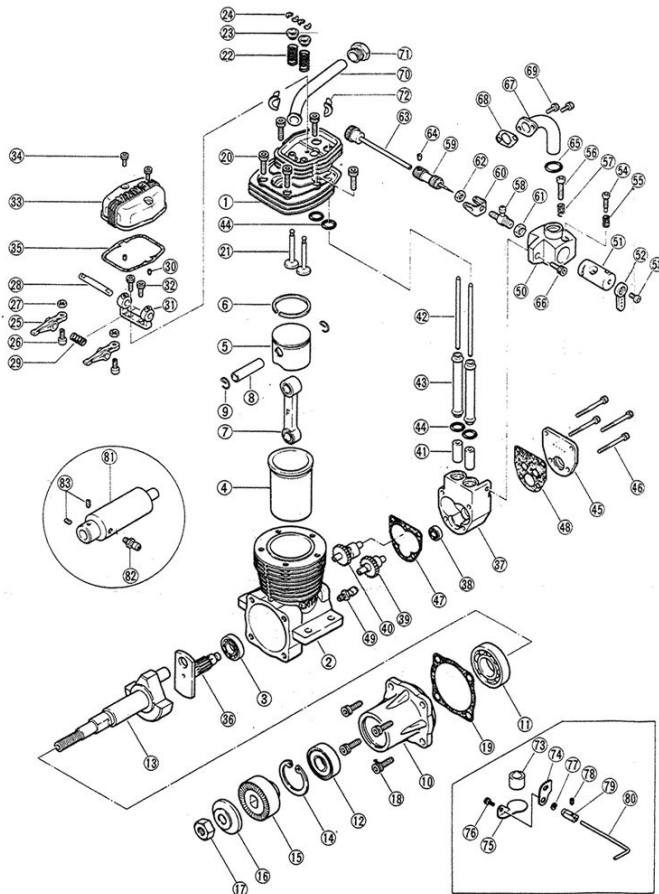
The following figure shows the correct positions of timing gears when the piston is at the top dead center.



* MAINTENANCE

1. Supply a small amount of oil sometimes around the valves and lockers.
2. Do not screw up the cylinder head of 60-4C 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 *



* PARTS LIST *

No. in drawing	Name of part	Qty.	Part No.
1	Cylinder head	1	604C01
	Crank case (with ball bearing)	1 set	604C03
2	Crank case	1	604C03A
3	Ball bearing	1	354C03B
	Cylinder liner & piston assembly	1 set	604C04
4	Cylinder liner	1	604C04A
5	Piston	1	604C04B
6	Piston ring	1	603B04C
7	Connecting rod	1	604C05
8	Piston pin	1	60X06
9	Piston pin stop ring	2	60X61
	Front housing (with ball bearings)	1 set	604C07
10	Front housing	1	604C07A
11	Ball bearing A	1	604C07B
12	Ball bearing B	1	604C07C
13	Crank shaft	1	604C08
14	Ball bearing retaining C ring	1	604C62
15	Drive washer	1	604C10
16	Propeller washer	1	60212
17	Propeller nut	1	29414
18	Front housing setting screw (4x12)	4	604C15A
19	Gasket of front housing	1	604C16
20	Cylinder head setting screw (3.5x12)	5	49X15A
21	Inlet & exhaust valve	2	604C71
22	Valve spring	2	604C72
23	Valve spring washer	2	604C73
24	Valve cotter	4	354C74
25	Valve locker arm	2	604C75
26	Valve locker screw	2	354C76
27	Valve locker screw locking nut	2	354C77
28	Locker shaft	1	604C78
29	Locker arm spacing spring	1	604C79
30	Locker shaft setting hollow screw (3x3)	2	604C63
31	Locker stay	1	604C64
32	Locker stay setting screw (3x8)	2	19X15C
33	Cylinder head cover	1	604C65
34	Cylinder head cover setting screw (3x4)	2	604C66
35	Cylinder head cover gasket	1	604C77
36	Timing gear shaft	1	604C81
	Timing gear box (with ball bearing)	1 set	604C82
37	Timing gear box	1	604C82A
38	Gear box bearing	1	354C83B
39	Inlet cam shaft	1	604C84
40	Exhaust cam shaft	1	604C85
41	Tapet	2	604C86
42	Push rod	2	604C87
43	Push rod tube	2	604C68
44	O ring for push rod tube (P-6)	4	354C40M
45	Back plate	1	604C88
46	Gear box setting screw (2.6x22)	4	604C89
47	Gasket of gear box	1	354C90
48	Gasket of back plate	1	354C91
49	Breathing nipple	1	604C92
	Carburetor assembly	1 set	604C40
50	Carburetor body	1	604C40A
51	Throttle valve	1	604C40B
52	Throttle lever	1	354C40C
53	Throttle lever setting screw (3x7)	1	60330E
54	Idling speed adjusting screw	1	19X40H
55	Spring	1	60330I
56	Idling mixture adjusting screw (3.0x17)	1	604C40J
57	Spring	1	60230K
	Needle valve assembly	1 set	604C40F
58	Spray bar	1	19X40F2
59	Needle	1	604C40F1
60	Needle stop spring	1	15220C
61	Spray bar locking nut	1	29440F4
62	4mm nut	1	09230F5
65	O ring (P-8)	1	604C40M
66	Carburetor setting screw (3x10)	1	354C15A
63	Needle extension	1	604C69
64	Needle extension setting screw (3x3)	1	604C63
67	Inlet manifold	1	604C41
68	Gasket of inlet manifold	1	604C42
69	Inlet manifold setting screw (2.6x6)	2	11CX15A
70	Exhaust pipe	1	604C45
71	Exhaust pipe setting nut	1	604C46
	Choke valve assembly	1 set	
73	Lip seal	1	604C93
74	Choke valve stay	1	604C94
75	Choke valve	1	604C95
76	Choke valve setting screw (2.6x6)	1	11CX15A
77	Spring washer 4mm	1	60X30LA
78	Choke lever setting screw (3x3)	1	604C63
79	Choke valve hinge pin	1	604C96
80	Choke lever	1	604C97
	Optional parts		
	Exhaust muffler unit	1 set	
81	Muffler body	1	604C98
82	Pressure nipple	1	093W03C
83	Muffler setting screw (3x3)	2	604C63
71	Exhaust pipe setting special nut	1	604C460P
72	Exhaust pipe holding cotter	2	604C47