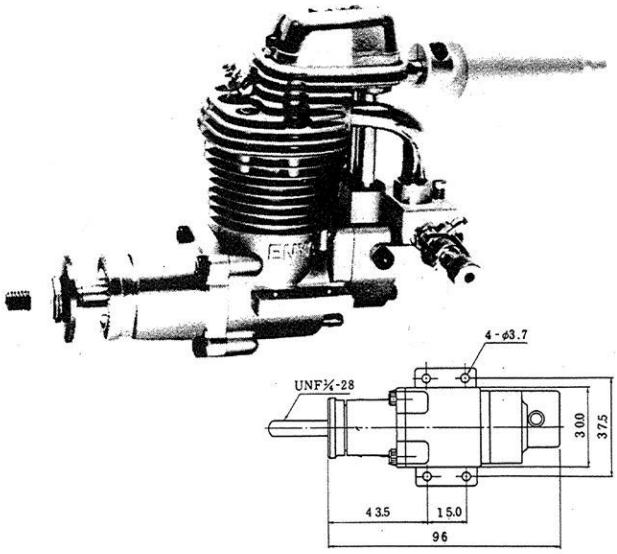
ENYA 41-4C

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. *Low and moderate exhaust sound*
4. *Easy starting and handling*
5. *Sturdy and dependable construction*

TECHNICAL DATA

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

		ENYA 41-4C
Cylinder bore x stroke	mm	22.3x17.0
Cylinder displacement	cc	6.64
Weight	g	370
Max. power	HP	0.7/12.500 r.p.m.
Practical speed range	r.p.m.	8,500~13,000
Idling speed	r.p.m.	2,500~3,000
Critical speed	r.p.m.	14,000~
Carburetor		ENYA GC type 5.5mm (with special starter system)
Cylinder liner and piston		Steel liner, ringed Al. piston
Size of propeller	in.	12x6, 11x6~7, 10x6~8
Glow plug		ENYA No.3
Suitable weight of plane	kg	2.0~3.5

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.
   - 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 41-4C, 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	15 ~ 20%
Nitro-methane	5 ~ 15%
Methyl-alcohol	80 ~ 65%

GLOW PLUG

ENYA glow plug No.3 is the best choice for 41-4C. You can get excellent power and nice idling with it.

PROPELLER

At first choose a well balanced 11 x 7~6 propeller of high quality for your 41-4C. 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 18~20cc per minute. Then, about 150~200cc 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 muffler tightly, and set the engine on the test stand or plane securely. Usually it is needless to pressurize the fuel tank.
3. Screw the choke rod and lock nut by 4~5 mm. And screw it up into the end of the throttle valve, putting the spring washer between them. You may do this process from the outside of the fuselage without fixing the lock nut directly with wrench, because the spring washer has the sufficient tension to stop the screw to loosen. As the throttle lever and its linkage slide sidewards by about 3mm when you pull the choke rod, it is needed to make some clearance inside of the fuselage to allow this movement.
4. 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

You can start ENYA 41-4C easily by handling its GC type carburetor properly. The ENYA GC carburetor has a newly designed starter system of unique and simple construction.

◉ In the case of cold weather below 10°C

1. Make sure your battery can heat the glow plug sufficiently.
2. Fill the fuel tank with fuel. Open the needle valve 3~4 turns.
3. Close the throttle valve down to the idling position. (The carburetor of 41-4C is adjusted in the factory to get fairly good idling.)
4. Pull the choke rod by your fingers. Then the throttle valve will slide about 3mm, and be closed completely. At the same time, the jet hole of priming fuel is opened at the inner side of the carburetor body where the vacuum of the inlet stroke is most strong.
5. Flip the propeller counter-clockwise 2~3 times against the compression stroke until the proper amount of liquid priming fuel is sucked into the cylinder and your flipping finger feels weak knocking. In cold weather the liquid fuel priming is very effective for starting.
6. Push the choke rod back to the normal position, and open the throttle valve a bit. (10~15%)
7. Connect the battery to the glow-plug and flip the propeller counter-clockwise quickly against the compression stroke. When the priming and other conditions are proper, the engine will start within several flips and continue to run at the medium speed of about 4.000~5.000 r.p.m.
8. When the priming is too much, the engine sometimes runs reversely. In such case, "clockwise flipping" is worth to try.

◉ In the case of mild or warm weather above 15°C

1. Fill the fuel tank with fuel and open the needle valve 3~4 turns.
2. Open the throttle valve a bit from the idling position, (about 10~15% of the stroke of the throttle lever.)
3. Pull the choke rod. Then the throttle valve will be almost closed remaining a very narrow slit.

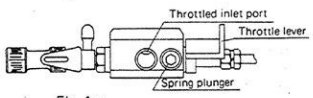


Fig. 1-a
The throttle valve is opened a bit from the idling position.

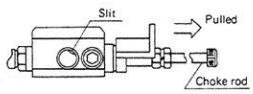


Fig. 1-b
The choke rod is pulled. And the inlet port becomes a narrow slit.

4. Flip the propeller counter-clockwise quickly 4~5 times samely as the starting. Then the fuel from the jet hole of priming is sucked into the cylinder together with the high speed air through the narrow slit making rich mixture suitable for starting. (We will name this process "Priming flip".)
5. Push the choke rod back to the normal position.
6. Connect the battery to glow plug and flip the propeller to start the engine samely as mentioned in the above item No.7. Usually the engine will start very soon.
7. In case the engine does not pop or only pops weakly, it means the priming mixture is too lean. Close the throttle valve only a bit, and pull the choke rod once more. Then the slit becomes narrower and you can get stronger suction. Repeat "Priming flip". And more rich mixture will be supplied. Then, the engine will start soon.
8. You can start 41-4C most easily by using an electric starter. In this case, the choke rod and priming process are all needless.

(Continued to next page)

✲ RUNNING

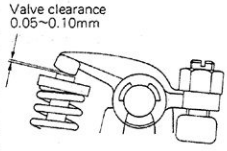
1. After your engine starts, open the throttle valve fully, and adjust the needle valve slowly to the best running position. But it is very important to run the engine always with a slightly rich mixture to get the best performance.
2. Close the throttle valve slowly and check the idling. The reasonable idling speed of 41-4C is 2,500~3,000 r.p.m.. Usually, 41-4C 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 1/4 turn at one time, seeing the result carefully.
3. Try hi-lo and lo-hi operation several times, and make sure that the engine has no tendency to stop.
4. In the medium speed range between full throttle and idling, the engine runs steadily with the slightly rich mixture fed by the ENYA GC type carburetor.

✲ BREAK IN

Break in your 41-4C 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 41-4C 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.)



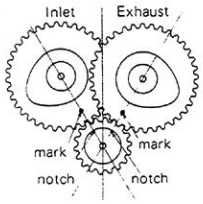
✲ MATTERS THAT DEMANDS SPECIAL ATTENTION

1. The disassembling and assembling of ENYA 41-4C 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.

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



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

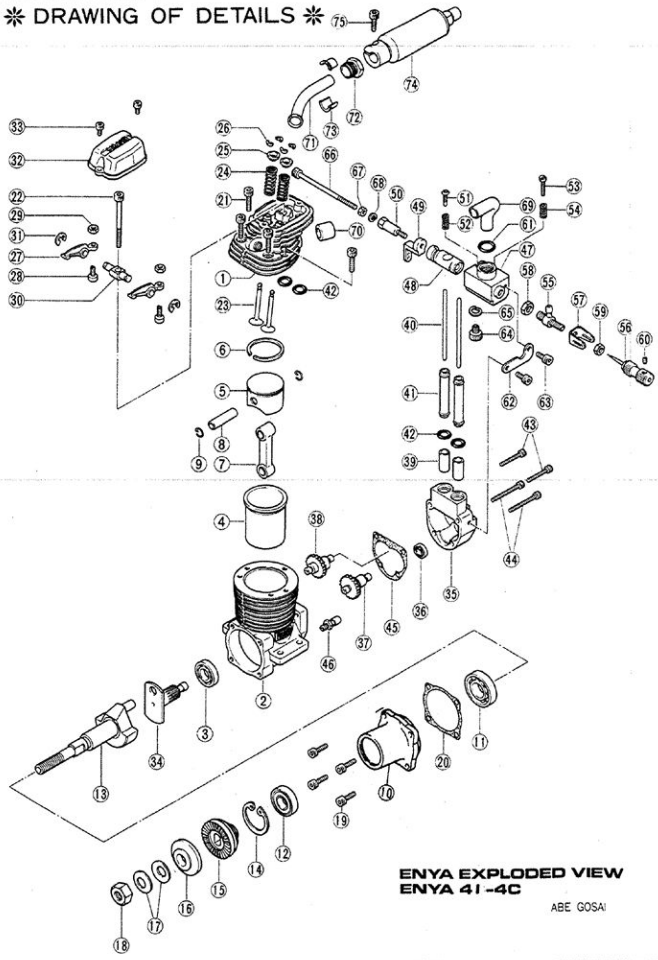
✲ CYLINDER HEAD GASKET

The ENYA 41-4C is assembled with no cylinder head gasket. The compression ratio is adequate for normal running. But, in case you use a big size propeller (12~13 inch dia.) and find some tendency of engine knocking, it is recommended to use the optional cylinder head gasket (enclosed in the box). Disassemble the cylinder head, and insert the gasket between cylinder head and cylinder liner. The compression ratio becomes low, and the knocking tendency will vanish.

✲ MAINTENANCE

1. Do not screw up the cylinder head of 41-4C too tightly to avoid the deformation of cylinder liner.
2. 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 ✲



ENYA EXPLODED VIEW
ENYA 41-4C

ABE GOSAI

✲ PARTS LIST ✲

No. in drawing	Name of part	Qty.	Part No.
1	Cylinder head	1	464C01
	Crank case (with ball bearing)	1 set	414C03
2	Crank case	1	414C03A
3	Ball bearing	1	354C03B
	Cylinder liner & piston assembly	1 set	414C04
4	Cylinder liner	1	414C04A
5	Piston	1	414C04B
6	Piston ring	1	45204C
7	Connecting rod	1	354C05
8	Piston pin	1	414C06
9	Piston pin stop ring	2	464C61
	Front housing (with ball bearing)	1 set	414C07
10	Front housing	1	414C07A
11	Ball bearing A	1	414C07B
12	Ball bearing B	1	414C07C
13	Crank shaft	1	414C08
14	Ball bearing retaining C ring	1	464C62
15	Drive washer	1	464C10
16	Propeller washer	1	464C12
17	Conical spring	2	464C13
18	Propeller nut	1	195B14
19	Front housing setting screw (3x10)	4	354C15A
20	Gasket of font housing	1	414C16
21	Cylinder head setting screw (3x14)	4	464C19A
22	Cylinder head setting screw (3x35)	1	414C19B
23	Inlet & exhaust valve	2	464C71
24	Valve spring	2	604C72
25	Valve spring washer	2	604C73
26	Valve cotter	4	354C74
27	Valve locker arm	2	464C75
28	Valve locker screw	2	354C76
29	Valve locker screw locking nut	2	354C77
30	Locker shaft	1	464C78
31	E ring	2	354C80
32	Cylinder head cover	1	464C65
33	Cylinder head cover setting screw (2.6x6)	2	11CX15A
34	Timing gear shaft	1	414C81
	Timing gear box (with ball bearing)	1 set	414C82
35	Timing gear box	1	414C82A
36	Ball bearing	1	354C83B
37	Inlet cam shaft	1	464C84
38	Exhaust cam shaft	1	464C85
39	Tapet	2	414C86
40	Push rod	2	414C87
41	Push rod tube	2	464C68
42	O ring (P-5)	4	464C67
43	Gear box setting screw (2.6x15)	2	904C66
44	Gear box setting screw (2.6x18)	2	464C66B
45	Gasket of gear box	1	354C90
46	Breathing nipple	1	354C92
	Carburetor assembly	1 set	414C40
47	Carburetor body	1	464C40A
48	Throttle valve	1	414C40B
49	Throttle lever	1	19X40C
50	Throttle lever setting screw	1	464C30E
51	Idling speed adjusting screw	1	60230H
52	Spring	1	19X40K
53	Idling mixture adjusting screw	1	19X40J
54	Spring	1	19X40K
	Needle valve assembly	1 set	464C40F
55	Spray bar	1	19X40F2
56	Needle	1	464C40F1
57	Needle stop spring	1	15220C
58	Spray bar locking nut	1	29430F4
59	4mm nut	1	09230F5
60	Hollow screw (3x3)	1	604C63
61	O ring (P-7)	1	464C40M
62	Carburetor body stay	1	464C55
63	Stay setting screw (3x8)	2	19X15C
64	Spring plunger	1	464C56
65	4mm Spring washer	1	M092D
66	Choke rod (3x50)	1	464C97
67	3mm Nut	1	TM19D3
68	3mm Spring washer	1	60X50R
69	Inlet manifold	1	414C41
70	Inlet manifold seal	1	604C93
71	Exhaust pipe	1	604C45
72	Exhaust pipe setting nut	1	604C46OP
73	Exhaust pipe holding cotter	2	604C47
74	Muffler body	1	604C98
75	Muffler setting screw (3x8)	1	19X15C
	Cylinder head gasket	1	404C65

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