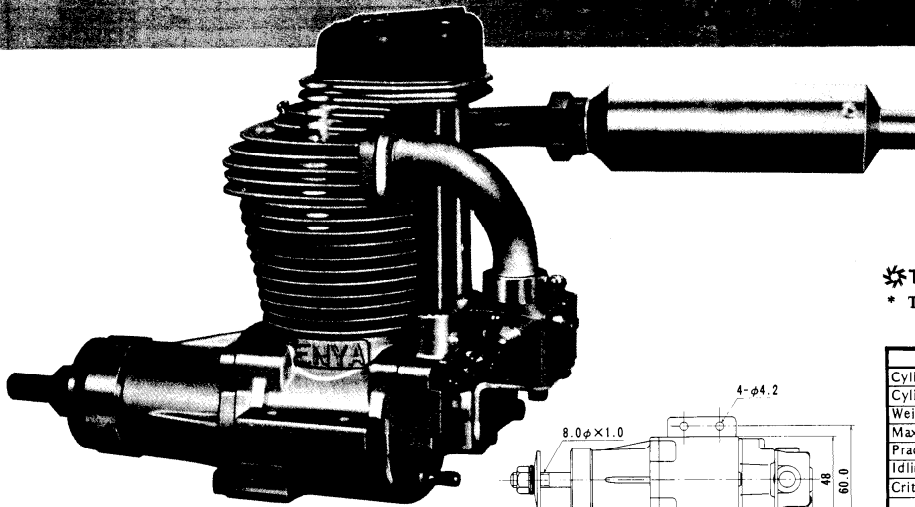


ENYA

R120-4C

4 stroke cycle engine



✳️ DISTINCTIVE FEATURES

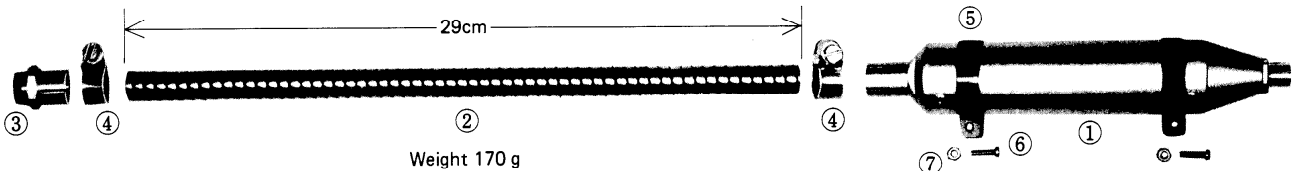
1. **ULTRA HIGH POWER and TORQUE** nice speed controlling
2. Suitable for model R/C aerobatic, sport, and scale planes.
3. Sturdy and dependable construction
4. Easy handling

✳️ TECHNICAL DATA

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

ENYA R120-4C		
Cylinder bore x stroke	mm	31.0 x 26.4
Cylinder displacement	cc	19.93
Weight	g	910 (with muffler)
Max. power	HP	2.1/12,500 r.p.m.
Practical speed range	r.p.m.	9,000 ~ 12,500
Idling speed	r.p.m.	2,500 ~ 3,000
Critical speed	r.p.m.	13,000 ~
Carburetor	ENYA GC type 9.0mm (with special starter system)	
Cylinder liner and piston	steel liner, ringed Al. piston	
Size of propeller	in.	12.5 x 9 ~ 12, 13 x 8 ~ 9, 14 x 7 ~ 9, 15 x 6 ~ 7
Glow plug	ENYA No. 3, No.4	
Suitable weight of plane	kg	4.0 ~ 7.5

✳️ OPTIONAL SPECIAL MUFFLER WITH FLEXIBLE TUBE (soft noise and least 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.
 - 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 R120-4C, 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 and No.4 are suitable to R120-4C.

✳️ PROPELLER

ENYA R120-4C will perform best with the propellers of high quality which run 9,000 ~ 11,500 r.p.m. on the ground. Do not use too big propellers.

At first choose a well balanced 15 x 6, 14 x 8, or 13 x 9 propeller of high quality for your R120-4C. 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.

In case your propeller has a tendency to loosen by the engine knocking, attach 2 knock-pin screws (enclosed in the box) on the drive washer. In this case, it is needed to drill 2 holes of 3mm dia. in the boss of propeller in which the knock-pins are to be fixed.

✳️ FUEL TANK

The fuel consumption is about 35cc per minute. Then, about 400cc ~ 500cc 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. Set the glow plug and propeller tightly. Choose the best setting angle of propeller at the compression stroke to flip it with your finger.
4. Close the needle valve, and fill the fuel tank with fuel.

✳️ STARTING AND RUNNING

1. You can start ENYA R120-4C most easily by an electric starter. In this case, starter system is needless. Open the needle valve 4 ~ 5 turns, and close the throttle valve by 50 ~ 70%. Then, make the battery connection on the glow plug, and run the engine by the starter counter-clockwise. The fuel will be sucked into the carburetor, and the engine will begin to pop and start in several seconds.
2. After your engine starts, detach the battery connection, and open the throttle valve fully. 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.

3. Close the throttle valve slowly and check the idling. The reasonable idling speed of R120-4C is 2,500 ~ 3,000 r.p.m. Usually, R120-4C prefers rather rich mixture at idling. Control the idling mixture with the idling mixture adjusting screw. When you want richer mixture, close this screw 1/4 or 1/2 turn at one time, seeing the result carefully.
4. Try hi-lo and lo-hi operation several times, and make sure that the engine has no tendency to stop.
5. In the medium speed range between full throttle and idling, the engine runs steadily with the slightly rich mixture fed by the GC type carburetor.

✳️ STARTING BY HAND FLIP

When you start R120-4C by your hand flipping, do it carefully in all respects, because the compression and torque are much stronger than usual smaller model engines. To use a tight glove or some other protector is indispensable to guard your hand.

The GC carburetor of ENYA R120-4C has a newly designed starter system of unique and simple construction same as that of 46-4C. Handle this carburetor properly, and you will be able to start your R120-4C rather easily.

● 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 4 ~ 5 turns.
3. Close the throttle valve down to the idling position. (The carburetor of R120-4C 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.

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

1. Fill the fuel tank with fuel and open the needle valve 4 ~ 5 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.

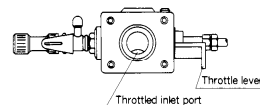


Fig. 1-a
The throttle valve is opened a bit from the idling position.

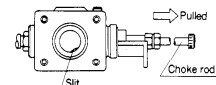


Fig. 1-b
The choke rod is pulled. And the inlet port becomes a narrow slit.

4. Flip the propeller counter-clockwise quickly 4 ~ 5 times 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 as mentioned in the above item No.7. Usually the engine will start very soon.

(Continued to next page)

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.

* PARTS LIST *

* RUNNING

- 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.
- Close the throttle valve slowly and check the idling. The reasonable idling speed of R120-4C is 2,500 ~ 3,000 r.p.m.. Usually, R120-4C 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.
- Try hi-lo and lo-hi operation several times, and make sure that the engine has no tendency to stop.
- 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.

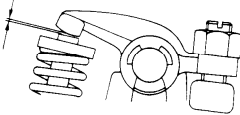
* BREAK IN

Break in your R120-4C 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 R120-4C 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).

Valve clearance
0.05 ~ 0.10mm

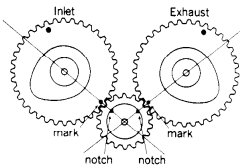


* MATTERS THAT DEMANDS SPECIAL ATTENTION

- The disassembling and assembling of ENYA R120-4C is not so difficult. But do it carefully.
- 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	30° B.T.D.C.
"	close	70° A.B.D.C.
Exhaust valve	open	70° B.B.D.C.
"	close	30° 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)

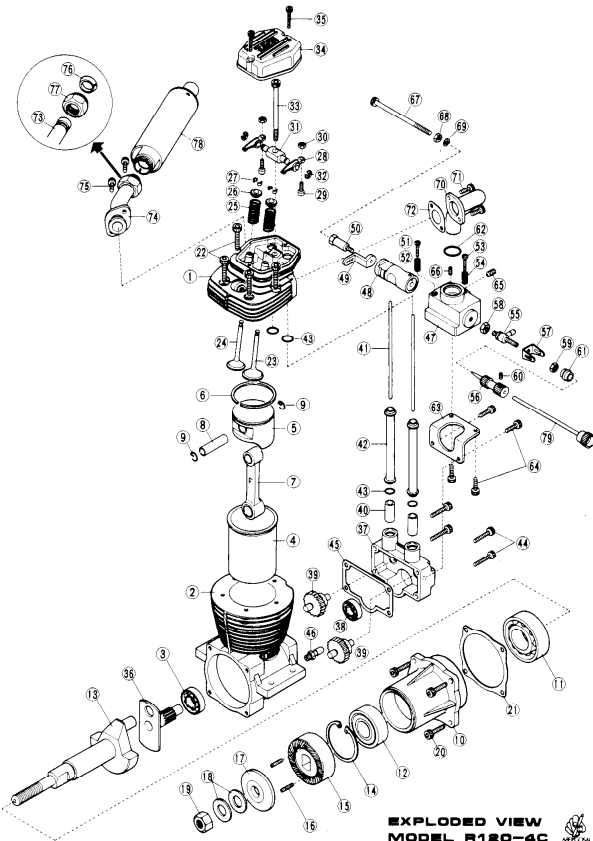


- When you assemble the engine, proper lubrication on all the parts are recommended.

* MAINTENANCE

- Do not screw up the cylinder head of R120-4C too tightly to avoid the deformation of cylinder liner.
- 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 R120-4C

No. in drawing	Name of part	Qty.	Part No.
1	Cylinder head	1	R1204C01
2 ~ 3	Crank case (with ball bearing)	1 set	R1204C03
2	Crank case	1	R1204C03A
3	Ball bearing	1	11CX03B
4 ~ 6	Cylinder liner & piston assembly	1 set	R1204C04
4	Cylinder liner	1	R1204C04A
5	Piston	1	1204C04B
6	Piston ring	1	1204C04C
7	Connecting rod	1	R1204C05
8	Piston pin	1	1204C06
9	Piston pin stop ring	2	1204C61
10 ~ 12	Front housing (with ball bearing)	1 set	R1204C07
10	Front housing	1	R1204C07A
11	Ball bearing A	1	R1204C07B
12	Ball bearing B	1	R1204C07C
13	Crank shaft	1	R1204C08
14	Ball bearing retaining C ring	1	R1204C62
15	Drive washer	1	R1204C10
16	Hollow screw (3 x 10)	2	1204C11
17	Propeller washer	1	R1204C12
18	Cylindrical spring washer	2	R1204C13
19	Propeller nut	1	R1204C14
20	Front housing setting screw (4 x 14)	4	60X15C
21	Gasket of front housing	1	R1204C16
22	Cylinder head setting screw (4 x 18)	4	904C15A
23	Inlet valve	1	R1204C71I
24	Exhaust valve	1	R1204C71E
25	Valve spring	2	R1204C72
26	Valve spring washer	2	R1204C73
27	Valve cotter	4	354C74
28	Valve locker arm	2	464C75
29	Valve locker screw	2	354C76
30	Valve locker screw locking nut	2	354C77
31	Locker shaft	1	R1204C78
32	E ring	2	354C80
33	Locker shaft setting screw (4 x 45)	1	R1204C19B
34	Cylinder head cover	1	904C65
35	Cylinder head cover setting screw (2.6 x 15)	2	904C66
36	Timing gear shaft	1	R1204C81
37 ~ 38	Timing gear box (with ball bearing)	1 set	R1204C82
37	Timing gear box	1	R1204C82A
38	Gear box bearing	1	904C82B
39	Inlet & exhaust camshaft	2	R1204C84
40	Tapet	2	R1204C86
41	Push rod	2	R1204C87
42	Push rod tube	2	R1204C68
43	O ring for push rod tube (P-6)	4	354C40M
44	Gear box setting screw (3 x 15)	4	354C19A
45	Gasket of gear box	1	R1204C90
46	Breathing nipple	1	093W03C
47 ~ 48	Carburetor assembly	1 set	R1204C40
47	Carburetor body	1	R1204C40A
48	Throttle valve	1	R1204C40B
49	Throttle lever	1	19X40C
50	Throttle lever setting screw	1	464C30E
51	Idling speed adjusting screw	1	60X40H
52	Spring	1	60330I
53	Idling mixture adjusting screw	1	60X40H
54	Spring	1	60330I
55 ~ 61	Needle valve assembly	1 set	R1204C40F
55	Spray bar	1	1204C40F2
56	Needle	1	1204C40F1
57	Needle stop ring	1	15220C
58	Spray bar locking nut	1	29440F4
59	4mm nut	1	09230F5
60	Hollow screw (3 x 3)	1	604C63
61	Oil seal	1	60X60M
62	O ring (P-12)	1	R1204C40M
63	Carburetor body bracket	1	R1204C55
64	Bracket setting screw (3 x 8)	4	19X15C
65	Spring plunger	1	R1204C56
66	Hollow screw (3 x 3)	1	604C63
67	Choke rod (3 x 50)	1	464C97
68	3mm Nut	1	TM19D3
69	3mm Spring washer	1	60X50R
70	Inlet pipe	1	R1204C41
71	Inlet pipe setting screw (3 x 8)	2	19X15C
72	Gasket of inlet pipe	1	R1204C42
73	Exhaust pipe	1	R1204C45
74	Exhaust pipe clamp	1	R1204C46
75	Exhaust pipe setting screw (3 x 8)	2	19X15C
76	Muffler collet	1	R1204C43
77	Muffler nut	1	R1204C44
78	Muffler body	1	R1204C98
79	Needle extension	1	904C69

OPTIONAL SPECIAL MUFFLER

Photo	Special muffler assembly	Qty.	Part No.
1	Special muffler assembly	1 set	SMR1204C
2 ~ 4	Special muffler body	1	R1204C47
2	Flexible tube unit	1 set	R1204C48
3	Flexible tube	1	904C48A
2	Joint to engine	1	R1204C48B
4	Flexible tube clamp	2	904C48D
5	Muffler body setting band	2	TM19D1
6	Screw	2	TM19D2
7	Nut	2	TM19D3

Specifications are subject to change without any notice.

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