

36-4CD AL-CHROME TN

OPERATING INSTRUCTIONS

36-4C TN
AL-CHROME

Diesel

enya

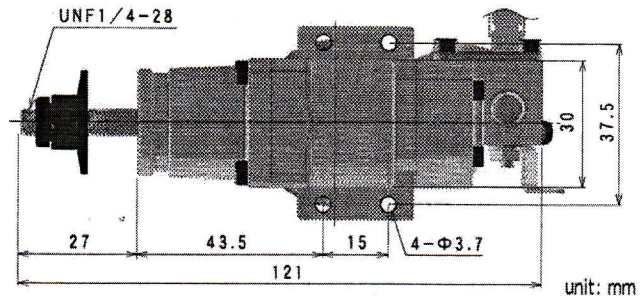
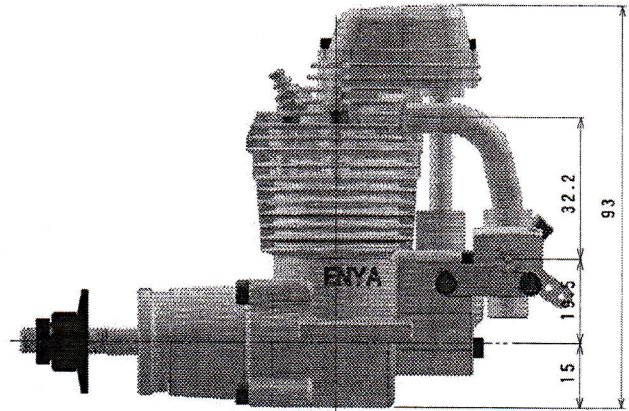
CONTENTS OF PACKAGE

- ENGINE × 1 set
 - An attachment for engine, each 1set
 - [Main needle, hollow screw, needle seal, each 1 pcs]
 - [Head cover & set screw × 1 set, push rod tube × 2]
- M534C MUFFLER × 1 set
- S5065 HEAD GASKET × 2 pcs
- TS534C TOOL SET × 1 set
 - [Screw driver (-) × 1, open-end wrench × 2, allen wrench × 3]
- INSTRUCTIONS
 - [General catalogue, this manual for engine]

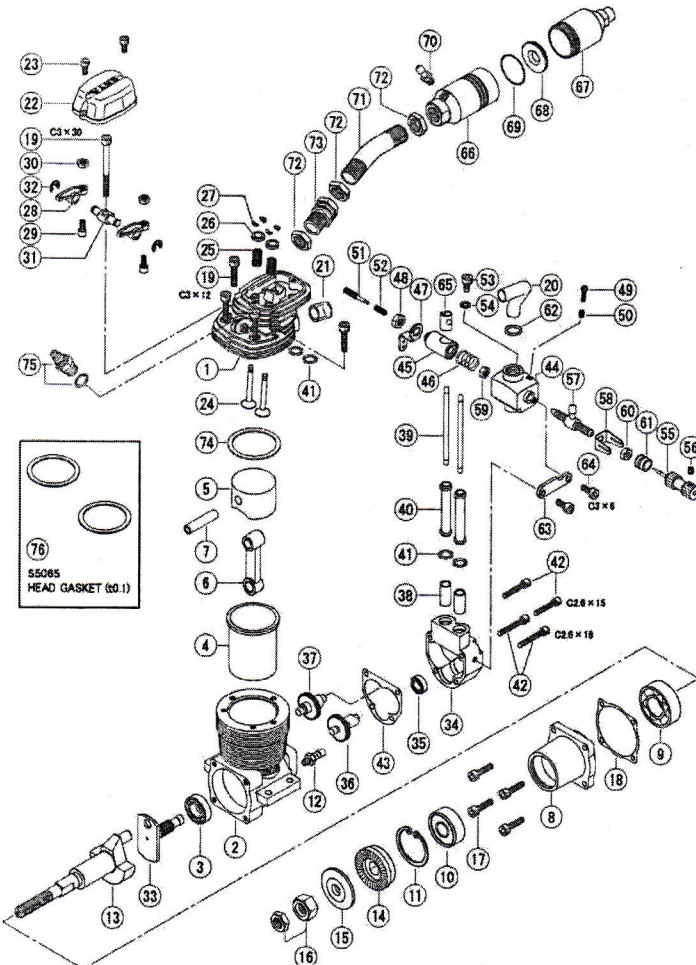
TECHNICAL DATA

TYPE: 4 stroke cycle, diesel: self-ignition, with overhead valves driven by push rods and twin camshafts.

	36-4CD AL-CHROME TN
Displacement	5.89 cc (0.359 cu.in.)
Bore × Stroke	21.0 × 17.0 mm
Max power	0.6 HP
Rotational speed	1,800~9,000 rpm
Weight	360 g (without muffler)
Size of propeller	12~14 × 8~5 in.
Weight of airplane	2.0~3.5 kg



EXPLODED VIEW



Note: The new 36-4CD is assembled without head cover and push rod tube. After finish the break in, assemble these parts as shown in the exploded view.

Order of assembling the pushrod tubes

1. Loose the single long screw ⑨, remove the valve rocker assembly from the head.
2. Remove the two push rods and set them aside.
3. Loose the other four head screws ⑨, insert the pushrod tubes.
4. After the pushrod tubes are in place, the rest of the engine can be assembled by the opposite procedure.

PARTS LIST

No. in drawing	Name of part	Qty.	Part No.	No. in drawing	Name of part	Qty.	Part No.
1	CYLINDER HEAD	1	414CD01	39	PUSH ROD	2	364CD87
2,3	CRANK CASE (W/BB)	1set	364CD3	40	PUSH ROD TUBE	2	414CD88
2	CRANK CASE	1	364CD3A	41	O RING (2PCS)	2sets	484C087
3	BALL BEARING	1	354CD3B	42	GEAR BOX SCREW SET	1set	484C89B
4,5	CYL. LINER & PISTON ASSY	1set	364CD04		(O2.8 × 15, 2pcs, O2.6 × 18, 2pcs)		
4	CYLINDER LINER	1	364CD04A	43	GEAR BOX GASKET	1	354C90
5	PISTON	1	364CD04B	44-45	CARBURETOR ASSY	1set	414CD70
6	CONNECTING ROD	1	414CD05	44	THROTTLE BODY	1	534C70A
7	PISTON PIN	1	364CD08	45	THROTTLE VALVE	1	530H70B
8-11	FRONT HOUSING (W/BB)	1set	414CD07	46	VALVE SPRING	1	S2570N
8	FRONT HOUSING	1	414CD07A	47	TV LEVER	1	S2570C
9	BALL BEARING A	1	414CD07B	48	LEVER SETTING SCREW	1	29440F4
10	BALL BEARING B	1	414CD07C	49	IDL SPEED ADJUSTING SCREW	1	15240H
11	RETAINING O RING	1	804C82	50	LOCKING SPRING	1	15240I
12	BREATHING NIPPLE	1	354C92	51	MIXTURE CONTROL NEEDLE	1	S2570M1
13	CRANK SHAFT	1	414CD08	52	LOCKING SPRING	1	S2570M2
14	DRIVE WASHER	1	484C10	53	VALVE GUIDE SCREW	1	S2570Y
15	PROPELLER WASHER	1	484C12	54	SPRING WASHER	1	SW3
16	PROPELLER LOCK NUT SET	1set	RNU20	55-61	NEEDLE VALVE ASSY	1set	534C70F
17	FRONT HOUSING SCREW SET	1set	354C15B	55	MAIN NEEDLE	1	484C40F1
				56	HOLLOW SCREW	1	604C53
				57	SPRAY BAR	1	534C70F2
18	FRONT HOUSING GASKET	1	414C16	58	NEEDLE SETTING SPRING	1	15220C
19	CYLINDER HEAD SCREW SET	1set	364CD19C	59	SPRAY BAR LOCKING NUT	1	S2570F4
					(O3 × 12, 4pcs, O3 × 30, 1pcs)		
20	INLET PIPE	1	414CD41	60	SPRING SETTING NUT 4MM	1	09230F5
21	INLET PIPE SEAL	1	484C93	61	NEEDLE SEAL	1	60X60M
22	HEAD COVER	1	484C85	62	O RING (FOR INLET PIPE)	1	484C40M
23	HEAD COVER SCREW SET	1set	414C86	63	TV BODY STAY	1	534C55
				64	STAY SETTING SCREW	2	C3 × 6
24	INLET & EXHAUST VALVE	2	484C71	65	VENTURI	1	534C70V
25	VALVE SPRING	2	804C72	66-70	MUFFLER ASSY	1set	M534C
26	VALVE SPRING WASHER	2	804C73	66-70	MUFFLER BODY ASSY	1set	534C98
27	VALVE GOTTER (2PCS)	2sets	354C74	66	MUFFLER BODY	1	534C98A
28	VALVE ROCKER	2	354C75	67	MUFFLER END	1	534C98B
29	ROCKER SCREW	2	354C76	68	BAFFLE PLATE	1	534C98C
30	ROCKER SCREW LOCKING NUT	2	354C77	69	O RING	1	534C98D
31	ROCKER SHAFT	1	484C78	70	PRESSURE NIPPLE	1	M352XJ
32	E RING (2POS)	1set	354C80	71	EXHAUST PIPE	1	534C45
33	TIMING GEAR SHAFT	1	414C81	72	EXHAUST PIPE LOCKING NUT	3	534C46
34,35	TIMING GEAR BOX (W/BB)	1set	414CD82	73	EXHAUST PIPE ADAPTER	1	534C50
34	TIMING GEAR BOX	1	414CD82A	74	HEAD GASKET (0.1)	1	S5065
35	GEAR BOX BEARING	1	354C83B	75	DUMMY PLUG & WASHER	1set	414DMP
36	INLET CAM SHAFT	1	484C84		(ATTACHMENT)		
37	EXHAUST CAM SHAFT	1	484C85	76	HEAD GASKET (0.1)	2	S5065
38	TAPPET	2	414C86		TOOL SET	1set	TS534C

❖ **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. When the 36-4CD is new, you may feel that the piston doesn't work smoothly (tight) near the top dead center. However, it is no problem because the 36-4CD is "AAC" specifications not to have a piston ring.
3. The 36-4CD is regulated to the suitable compression ratio at factory shipment. So, at first you should start running the engine just as it is.
4. The diesel engine has self-ignition system. Never idly flip the propeller, because it could start suddenly. Handle it with great care.
5. Before you run the 36-4CD, 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).
 - It is most important to confirm that your radio control equipment works well. If you find a defective point on it, you must never fly your plane. And then repair it perfectly.

❖ **FUEL**

The 36-4CD will start and run on commercially-available model diesel fuel of high quality. The recommended formula is 40% kerosene, 35% ethyl ether, and 25% castor oil. (1% to 2% amyl nitrite or amyl nitrate added to the fuel may make for slightly smoother running.)

❖ **PROPELLER**

The 36-4CD will perform best with the propellers of high quality which run 6,500 ~ 7,500 r.p.m. on the ground. At first choose the well-balanced 13 × 5 or 13 × 6 propeller of high quality. You can get smooth running and good idling with the propellers made of glass fiber 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 a fly-wheel.

❖ **FUEL TUBE**

The 36-4CD must not use the silicon-based fuel tube and rubber parts of the filler cap. Choose the goods made of vinyl or neoprene for the gasoline engine.

❖ **FUEL TANK**

A fuel tank of about 150 ~ 200 cc is recommended for normal flight. For easiest engine starting, set the fuel tank at nearly same level as the carburetor.

❖ **PROTECTIVE GLOBE**

Hand-starting is recommended for the 36-4CD, so prepare the strong leather gloves.

❖ **PREPARATIONS BEFORE STARTING**

1. Connect a piece of vinyl pipe of about 10 cm length on the breathing nipple, to lead the excess oil in the crank case out of the fuselage.
2. Add the various exhaust and muffler body to the cylinder head, as shown in the exploded view. Tighten these firmly, because they have a tendency to loose as the engine runs.
3. It is unnecessary to pressurize the fuel tank with the muffler pressure as a rule. It is good to stop the pressure nipple of exhaust muffler by a hose clip.
4. Set propeller with double rock nut tightly. At that time, choose the best setting angle of propeller at the compression stroke to flip it with your finger.

❖ **STARTING AND RUNNING**

The following process is recommended to start a new engine at the first time.

1. Fill the tank with diesel fuel, and close the filler cap.
2. Don't adjust the mixture control needle. It is important to keep it the factory default setting.
3. Open the main needle 2.5 turns from the fully closed position. (In case the tank is pressurized, 2 turns.)
4. Choke by closing the inlet port of carburetor with your finger. Turn the propeller very slowly until the fuel in the hose reaches to the carburetor. Then, in addition, turn the propeller about 5 times. The fuel as priming will be sucked into the crank case and blown up into the cylinder and combustion chamber.
5. Open the throttle valve by 40 ~ 50 %.
6. Flick the propeller counter-clockwise quickly by your hand with the protective glove.

7. The engine will start, keep running it while 20 ~ 30 seconds without adjusting the throttle valve. The engine will stall easily that its own isn't warming enough.
8. Open the throttle valve fully, then close the needle valve slowly to the best running position. But it is important to run the engine with a slightly rich mixture to get the best performance.
9. Close the throttle valve slowly, and set the idling speed. Reliable idling speed is 1800 ~ 2200 rpm.
10. Lastly, check the medium speed range to open and close (low-high, high-low) the throttle valve repeatedly. If the throttle response is slow-moving, close the mixture control needle 1/3 ~ 1/4 turns to mean some rich mixture. If the throttle response is quick-moving, open the mixture control needle 1/3 ~ 1/4 turns to mean some weak mixture. In any case watch the result carefully.
11. If you lost adjustment, start again from the factory default settings first of all.

※ Standard of needle setting (without the muffler pressure)

Order of adjustment	Range of adjustment	Default	Break in	Real run
1. Main needle valve	High speed	---	About 2.5 turns	About 2 turns
2. Mixture control needle	Idling ~ middle speed	1.5 turns	1.5 turns	1.5 turns

❖ **BREAK IN**

Run your engine about 1/2 ~ 1 hour on the ground. 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.

❖ **HEAD GASKET**

The compression ratio is adequate for normal running. But in case you use a big propeller and find some tendency of engine knocking, it is recommended to use the extra head gasket (enclosed in the box, 2pcs). Disassemble the cylinder head, insert the gasket between cylinder head and liner. The compression ratio becomes low, and the knocking tendency will vanish.

❖ **MAINTENANCE**

1. Don't screw the cylinder head of 36-4CD tightly to avoid the deformation of cylinder liner.
2. Screw the cylinder head to crank case when the engine is cold.
3. It is usually needless to supply some oil to the inner mechanism, because the oil contained in fuel lubricates oil of the parts.

❖ **ADJUSTMENT OF VALVE CLEARANCE**

The normal valve clearances of the 36-4CD are 0.1 ~ 0.15 mm when the engine is cold. It is recommended to make the first adjustment of valve clearance after first 1/2 ~ 1 hour of running with the wrench and driver enclosed in the box. Also adding or removing the cylinder head gasket will affect the valve clearance setting. Be sure to re-adjust it. 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
0.1~0.15 mm



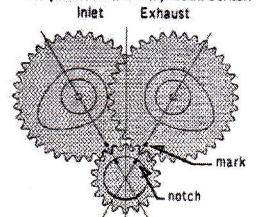
❖ **METHOD OF ENGAGING TIMING GEAR WITH CAM SHAFTS**

The disassembling and assembling of the 36-4CD is not so difficult. But do it carefully.

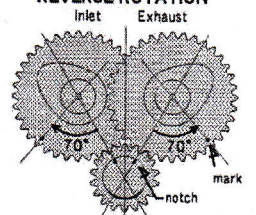
1. When you assemble the timing gear box, put the piston at the top dead center, and then combine the notches of gear shafts and the marks of cam shafts as shown in the figure on the right. The standard timing of valves are as follows.
 - Inlet valve open 20° B.T.D.C.
 - Inlet valve close 60° A.B.D.C.
 - Exhaust valve open 60° B.B.D.C.
 - Exhaust valve close 20° A.T.D.C.

NORMAL ROTATION

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



REVERSE ROTATION



2. The 36-4CD of normal rotation can be modified into the reversal engine. Rebuild to move each (inlet and exhaust) cam shafts 70 degrees to the left or right, as shown in the figure on the right.