

A new design with rotating-cylinder porting

RCV 58 CD

FOUR-STROKE

by Bob Gilbert

I love engines. I really love unusual and different engines. I own many that fit into this category, but this engine has more attraction for me than all the others. The RCV 58 is a highly functional model aircraft powerplant that has some endearing traits that particularly appeal to this mechanical engineer.

This is a really new, four-stroke model aircraft engine design. The cylinder rotates, and the valve drum is part of the cylinder. There are no poppet valves and no valve adjustment is ever needed or even possible. For an engine of this displacement, it has a reduced overall height.

This engine is one of the latest engines from RCV Engines Ltd., in Dorset, UK. The earlier engines from RCV are of much larger displacement and very often find homes in 1/4 and 1/3 scale aircraft.

The first thing apparent when opening the rather small box, for a .58-size 4-stroke, is the size of the engine. It looks small, and in one particular dimension it really is. The distance from the prop shaft to the top of the cylinder head is only 68 mm (2.65 in.). The carburetor sits directly behind the cylinder head. These two features make it the kind of engine that wants to find a home in a scale airplane. It is a good-looking engine, with excellent castings and machined surfaces.



SPECS

TYPE: 4-Stroke single cylinder model airplane engine.

SIZE: .58 cubic inch displacement.

WEIGHT: with muffler—19.4 oz. (550g)

PROP SIZE RANGE: 10X9, 10X10, 11X6, 11X8, 12X6, 12X7

IGNITION: Glow plug

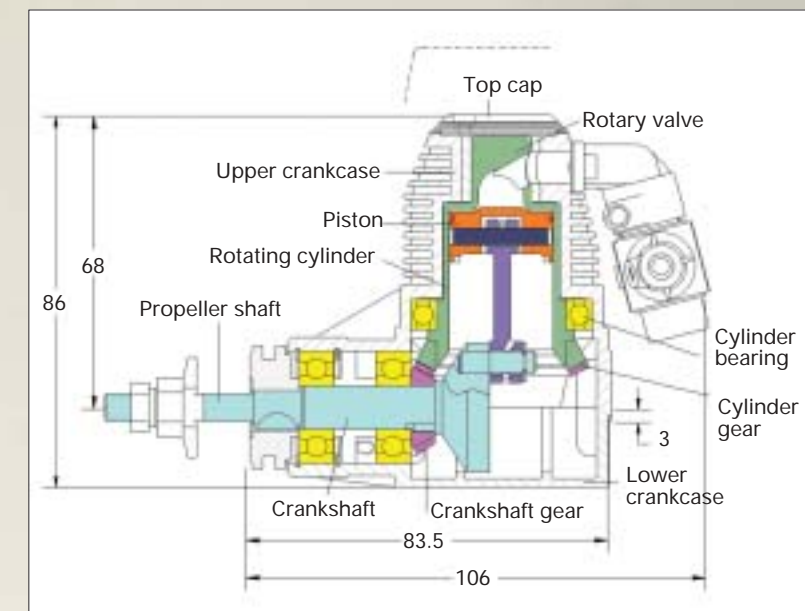
PROP SHAFT: 1/4 -28 UNF (US Standard)

SUPPLIED WITH ENGINE: Two hex wrenches, 8-page owner's guide, exploded parts view and 2-year warranty registration form.

This .58 cubic inch displacement mill has a cylinder that rotates about an axis that is vertical when compared to the crankshaft that is horizontal. The piston is driven up and down in the same fashion as any other 4-stroke. The crankshaft has a bevel gear just behind a set of two ball bearings that support the crankshaft (see cutaway photo). The cylinder has a bevel gear attached to its base. The cylinder is supported by and rotates in its own ball bearing—thereby achieving all intake and exhaust porting. The bevel gear ratio is 2:1, which allows the cylinder and its attached valve in the head to rotate at one half of the crankshaft speed. Refer to the cutaway photo to help visualize how it works.

SETTING UP AND RUNNING THE RCV 58

I installed the RCV 58 on my engine test stand. I noticed that the crankcase is wider than usual and the spacing of the mount-



ing holes is much longer, front-to-rear, than would be typical for this size engine.

Next I read the owner's guide from front to back, as operation of this unique engine is bound to have some departures from the normal routine. I installed an APC 11x6 prop, as recommended. Installing the prop requires a 12 mm and a 10 mm wrench. After tightening the 12 mm nut, the 10 mm locknut is tightened into a recess in the 12 mm nut. This locks the propeller on and it was never thrown.

The tank was filled with recommended fuel of 10% nitro and 15% oil including no more than 6% castor oil. I used Wildcat fuel that matched this requirement. An O.S.-type F plug was recommended and that's what I installed.

I lit the glow plug with a metered glow lighter so that I could verify that the plug was operating. Having already set the needle valve to the specified setting of two turns open, I applied an electric starter to the prop shaft, but the engine did not start. I read the instructions again, and could not find any recommendation that I prime the engine prior to applying the starter. It should start within a few seconds the instructions said, but it did not. So then I tried using a very standard starting technique that I use with most four strokes:

- Set the throttle at 1/8 or so.
- Apply the glow lighter.
- Apply the electric starter.
- As soon as the engine is turning, close the outlet of the muffler with a finger. This will prime the engine and the engine will start. Be sure to remove your finger at the first sign of operation.

This method produced excellent results with the RCV 58. When the engine is warm it is not necessary to choke the engine at all. It starts right up. There are detailed instructions on breaking in the engine as well as carburetor adjustment.

I ran the engine approximately one hour and then made some rpm measurements

PHOTOS BY WALTER SIDAS AND TOM ATWOOD

RCV 58 CD FOUR-STROKE

Mfg.	Size	Max rpm	Idle
APC	11x6	11,100	2,600
APC	11x5	11,200	2,500
Graupner	12x6	9,300	2,500
Graupner	12x8	9,100	2,600

with a few different props. Throttle response is excellent from all speeds.

This is a good showing for an engine of this size, and I am sure that the overall performance will increase as the engine gets more time on it.

FLIGHT TESTING

I couldn't wait to see just how this really neat engine was going to perform in the air. The only airplane I had available at the moment was a 40-size Stick. Not the best looking plane, but just about the right size for a test, and at least the engine would sit outside for all to see.

When installing the engine I had to raise the tank so that top of the tank protruded above the fuselage about an inch. This was done to meet the requirement of having the centerline of the fuel tank aligned with that of the carburetor. At the field it drew lots of spectators.

So does it fly? You bet it does, and really well. Using an APC 11x6 prop it carried the 5 1/2 pound airplane straight up for at least 100 feet, much to the surprise of all. That is my normal take off style, and I did not expect this engine to perform this well. The sound it makes is somewhat different from other 4-strokes, but I cannot explain the difference. I did run one sound check using the 11X8 Graupner prop and at 9 feet: the reading was 90 to 91dBA.

CONCLUSION

This is a wonderful new engine that you can be proud to own. I think it can do a great job powering sport and scale aircraft. It starts easily and performs well. As I recently crashed the Stick I will be looking for a worthy new home for this simply great new engine. 🌀

Links

RCV Engines, www.rcvengines.com,
44 (120) 287-7044 (UK).

Wildcat Fuel, www.wildcatfuel.com,
(859) 885-5619.

For more information, please see our source guide on pg. 161.