

RCV58-CD

A bold new engine design

With rotating cylinders that drive props at half the crankshaft's speed, RCV engines have made a name for themselves in the modeling community. The RCV58-CD is the company's latest release, and its crankshaft, rather than a rotating cylinder, drives the prop. This allows the use of standard-size props, whereas the three original RCV engines required much larger-diameter props with double the pitch.

RCV engines are manufactured in England and are distributed in the U.S. by Wildcat Fuels Inc. "RCV" stands for "rotary cylinder valve," which is the main feature that sets these engines apart. The rotary valve replaces the valve-train components of a conventional poppet-valve, 4-stroke engine, so there are no valves that need periodic adjustments. The design avoids the rpm limitation of the conventional valve train, so the engines can use a wider range of prop sizes.

Mechanically, the RCV58-CD is similar to its predecessors but it's quite unusual when compared with conventional 4-strokes that have poppet valves (see the drawing). Its cylinder valve is built into the rotating cylinder, and a port aligns alternately with the intake, exhaust and glow plug at the correct time in the 4-stroke cycle. The large gear is attached to the cylinder base, and the small gear is attached to the crankshaft.

The manual is very well done; it includes sections on basic do's and don'ts; plug, fuel and prop selection; starting, break-in and installation; and care and maintenance. The RCV website's wealth of useful information includes a prop-selection chart, general specifications, diagrams and parts' lists with exploded-parts views (rcvengines.com).

MOUNTING

The manual includes a full-size diagram to help you plan installation. The carb is in the rear, as it is in most 4-strokes. The distance from the prop's centerline to the top of the engine is about 1/2 inch less than the average poppet-valve engine in this displacement range, so less of the engine protrudes from the cowl. The only other difference is that, because of the horizontally split crankcase, the bottoms of the mounting lugs are 3mm lower than the crankshaft and prop's centerline. This isn't a problem in new or un-cowled installations, but you should be aware of this if you're planning to replace a cowled engine with the

58-CD; it can affect whether the spinner lines up with the cowl.

BREAK-IN AND STARTING

Following the manual's instructions, I ran the engine on the test stand in 15-minute bursts for about 1 hour, with ample cooldown periods between runs. The lowest idle was about 2,400rpm without glow power. The idle rpm continued to improve during flight



SPECIFICATIONS

ENGINE: RCV58-CD
MANUFACTURER: RCV Engines Ltd.
DISTRIBUTOR: Wildcat Fuels
DISPLACEMENT: .58ci (9.5cc)
WARRANTY: 2 years
BORE: 0.945 in. (24mm)
STROKE: 0.827 in. (21mm)
PRACTICAL RPM RANGE: 2,100 to 12,000
THRUST: 4 to 6 lb. static (per RCV)
WEIGHT: 16.2 oz. w/out muffler, 20.9 oz. w/muffler
HEIGHT (CENTERLINE TO TOP): 2.68 in. (68mm)
WIDTH: 2.165 in. (55mm)
LENGTH (PROP DRIVER TO BACK OF CARB): 4.17 in. (106mm)
SHAFT DIAMETER: 1/4-28 UNF thread
FUEL CONSUMPTION: 0.6 oz./min.
PRICE: \$189

HITS

- Low-maintenance valve design.
- Low installed height.
- Broad rpm and prop range.
- Good idle and transition.
- Reversible carb.

MISSES

- None.

tests — down to about 2,100rpm.

For break-in and prop rpm tests, I used RCV's recommended APC 11x6 prop and Wildcat 15-percent-nitro fuel (16-percent total oil, of which 20 percent is castor and 80 percent is synthetic). This engine starts from the front (previous RCV engines needed to be started from the back). When an electric starter was used, the engine fired up instantly every time.

BASIC OPERATION

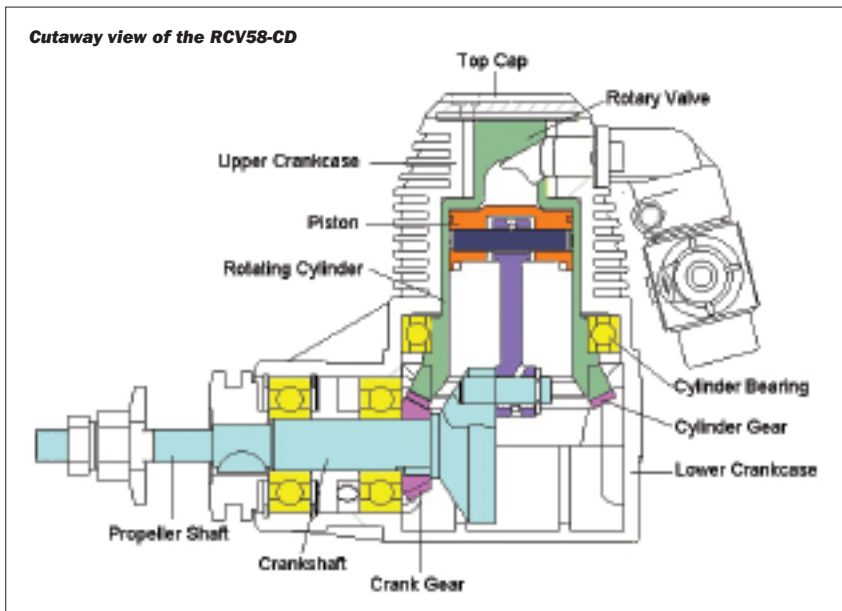
The engine's carb is adjusted similarly to other 4-strokes' carbs, except this engine preferred a rather rich idle adjustment. I found that the

PROP PERFORMANCE

| PROP | PEAK RPM | LOWEST IDLE RPM* |
|----------------------|----------|------------------|
| APC 11x6** | 10,900 | 2,200 |
| APC 11x7 | 10,200 | 2,300 |
| APC 12x6 | 9,500 | 2,200 |
| Master Airscrew 12x6 | 10,200 | 2,100 |

* Never fly at peak rpm; back off 200 to 300 on the rich side of peak for flight. After adjusting the low-speed mixture for the lowest possible idle, use the transmitter trim to raise the idle rpm 200 to 300.

** This prop recommended by RCV for general use. Other RCV suggested props: 10x9, 10x10, 11x8, 12x7.



adjustment was just right when there was a 500rpm drop (2,900 down to 2,400) when I removed the glow igniter. The idle doesn't need an onboard glow system to be reliable, and I didn't use or need one in my test-flying. The manual covers carb adjustment in great detail and gives a good review of the basic methods used on all 4-strokes. The high-speed needle was very broad (insensitive), and that may be a clue that the diameter of the carb's throat is a bit too large. This is often done to maximize power at the expense of fuel draw strength; however, I didn't experience any problems related to fuel draw during my flight tests.

The 58-CD sounds slightly different from a standard 4-stroke; it has a weak, but noticeable, gear noise. The engine has built-in gear backlash clearance. At the field, I measured the sound level at about 90db (9 feet from the exhaust



The RCV58-CD fits nicely in the test plane; the author used an articulated throttle linkage to manage the carburetor placement.



The Sig Four-Star 40 served as the test plane. It performed well with both the Master Airscrew 12x6 (shown) and the APC 11x7.

side with an APC 11x7 turning about 10,000rpm); this is quite acceptable.

TEST FLIGHTS

Running an engine on a test stand is great for break-in, but what better way to get acquainted with a new engine than to install and fly it in a favorite plane? My well-worn Sig Four-Star 40 serves well in this role.

With the 58-CD installed, the plane performed well; aerobatics, including inverted and knife-edge, were easy. Vertical maneuvers were OK, but prolonged hovering was not possible. Touch-and-go's were fun because of the reliability of the 58-CD. That's saying something because I tried a great variety of props! My favorite props were the APC and Master Airscrew 12x6; they had the best idle—about 2,200rpm. In fact, the Master Airscrew (2,100rpm) gave nice steep approaches because the prop had a braking effect! The APC 11x7 gave the best top speed.

The manual recommends the use of fuel that contains 10 percent nitro and at least 15 percent oil. Of the total oil content, no more than 6 percent should be castor oil. RCV doesn't recommend a special break-in fuel.

In my test runs, I used fuels ranging from 5 to 30 percent nitro and found the engine was not sensitive to various blends and brands. It responded as any conventional 4-stroke engine might: a greater nitro content produced slightly more power but also a higher fuel-consumption rate.

In-flight fuel consumption appeared to be quite low at about 0.6 ounce per minute on an average flight with a typical distribution of throttle settings and with touch-and-go's. I got about 13 minutes from an 8-ounce tank with a small reserve; I set my flight timer for 12 minutes and always landed with fuel remaining.

CONCLUSION

The RCV58-CD is appropriate for any sport, scale, or fun-fly airplane that needs a .35 to .46 2-stroke or a .40 to .65 4-stroke. Overall, it's about 1/2 inch shorter than the average 4-stroke, so it's a natural choice for tightly fitting, scale cowls.

Overall, the 58-CD has adequate power for its displacement, it idles and throttles well, is very reliable in flight, has good handling characteristics and a competitive price. It also offers the potential of low maintenance as a bonus! The slight gear sound blends nicely with the 4-stroke exhaust note—different enough to turn heads at the field! This engine surely represents a bold new concept in sport-plane nitro power. ⬆

APC Props; distributed by Landing Products (530) 661-0399; apcprop.com.

Master Airscrew; distributed by Windsor Propeller Co. (916) 631-8385; masterairscrew.com.

RCV Engines Ltd.; distributed by Wildcat Fuels.

Wildcat Fuels (859) 885-5619; orders only (888) 815-7575; wildcatfuel.com.